DOCUMENT RESUME

ED 440 608 HE 032 838

AUTHOR	Nettles, Michael T.; Perna, Laura W.; Bradburn, Ellen M.
TITLE	Salary, Promotion, and Tenure Status of Minority and Women Faculty in U.S. Colleges and Universities. National Study of Postsecondary Faculty, 1993 (NSOPF:93). Statistical Analysis Report.
INSTITUTION	Michigan Univ., Ann Arbor.; College Fund/UNCF, Fairfax, VA. Frederick D. Patterson Research Inst.; National Center for Education Statistics (ED), Washington, DC.
REPORT NO	NCES-2000-173
ISBN	ISBN-0-16-050303-5
PUB DATE	2000-03-00
NOTE	134p.
AVAILABLE FROM	ED Pubs, P.O. Box 1398, Jessup, MD 20794-1398. Tel: 877-433-7827 (Toll Free). U.S. Government Printing Office, Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402-9328.
PUB TYPE	Numerical/Quantitative Data (110) -- Reports - Research (143)
EDRS PRICE	MF01/PC06 Plus Postage.
DESCRIPTORS	*Academic Rank (Professional); Black Teachers; College Faculty; Employment Level; Full Time Faculty; Higher Education; Hispanic Americans; *Minority Groups; Predictor Variables; *Race; Racial Composition; *Racial Differences; Statistical Analysis; Tables (Data); Teacher Characteristics; *Teacher Salaries; Teacher Surveys; *Tenure; Tenured Faculty; Women Faculty
IDENTIFIERS	*National Study of Postsecondary Faculty

ABSTRACT

This report, using data from the 1992-93 National Study of Postsecondary Faculty, examines differences among postsecondary faculty by gender and by race/ethnicity. Comparisons were made on several human capital variables (education/experience) and structural variables (academic discipline/institution type), as well as for faculty outcomes (salary/tenure/rank). A multivariate analysis of factors associated with salary was also conducted. The study found differences between male and female faculty members in salary and rank, with female full-time faculty averaging lower salaries than males. Age, education, and experience also differed by gender, with female full-time faculty having lower educational levels and less experience than male faculty. Differences among racial/ethnic groups were also noted: white faculty generally had higher salaries and were more likely to be tenured and to be full professors than black faculty; and Black, non-Hispanic full-time faculty were less likely than white, non-Hispanic faculty to have higher salaries, tenure, and full professorships. Sections include an introduction, which notes prior research on the determinants of faculty salary, tenure, and rank, and methodology; sections examining representation of faculty by gender and by race/ethnicity; a section on the multivariate analysis; and a conclusion. Appended are technical notes, standard error tables, and additional data. (Contains 44 references.) (CH)

Reproductions supplied by EDRS are the best that can be made
from the original document.

HE

ED 440 608

NATIONAL CENTER FOR EDUCATION STATISTICS

Statistical Analysis Report March 2000

1993 National Study of Postsecondary Faculty (NSOPF:93)

Salary, Promotion, and Tenure Status of Minority and Women Faculty in U.S. Colleges and Universities

U.S. DEPARTMENT OF EDUCATION
Office of Educational Research and Improvement
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)
☑ This document has been reproduced as received from the person or organization originating it.
☐ Minor changes have been made to improve reproduction quality.
• Points of view or opinions stated in this document do not necessarily represent official OERI position or policy.

HE 032 858

U.S. Department of Education
Office of Educational Research and Improvement NCES 2000-173

BEST COPY AVAILABLE

Customer Survey of OERI Publication Users

To help us improve future editions of this publication and give you better customer service, we would appreciate your comments on this survey form. Please check the appropriate box(es) below for each question. Responses will be kept completely confidential. You may return the survey by mail or FAX. It can be folded and taped closed to allow mailing to the address listed on the reverse side of this form, or it can be returned by FAX to 202–219–1321. **Many thanks for your customer feedback—it is very important to us!**

1a. Name of publication

1b. Publication number

1c. Author name

2. How did you receive a copy of this publication?

- ❑ Bought it
- ❑ Borrowed it
- ❑ Mailing list membership
- ❑ Telephone request
- ❑ Internet request
- ❑ Other (please describe)

3. Was this publication easy to get?

❑ Very ❑ Somewhat ❑ Not at all

4. How did you find out about this and other OERI publications? (Check all that apply.)

- ❑ Conferences
- ❑ Journal articles
- ❑ Teacher/educator
- ❑ Professional associations
- ❑ Internet (WWW)
- ❑ Publication announcement
- ❑ Received in mail
- ❑ OERI staff contact

5. For what purposes did you use this OERI publication? (Check all that apply.)

- ❑ Planning
- ❑ Policy or legislation
- ❑ Administrative decisions
- ❑ Teaching, class material
- ❑ Research/analysis
- ❑ General information
- ❑ Writing news articles, TV or radio material
- ❑ Marketing, sales, or promotion
- ❑ Other (please describe)

6. Did the publication help you accomplish whatever you needed it for?

❑ Yes ❑ No ❑ Partially

7. What is your occupation?

❑ Parent ❑ Teacher ❑ Administrator
❑ Librarian ❑ Researcher ❑ Statistician
❑ Journalist/writer ❑ Policy Analyst ❑ Student
❑ Program Planner
❑ Other (please specify)

8. How could this OERI publication (or other OERI publications) better meet your needs? (Check all that apply.)

- ❑ More important topics in education
- ❑ More timely release of data
- ❑ More text introductions to each section
- ❑ More research statistics
- ❑ Shorter reports (less than 10 pages)
- ❑ Other (please describe)

9. Overall, how satisfied are you with this product?	**Very Satisfied** ❑	**Satisfied** ❑	**Dissatisfied** ❑
a. Comprehensiveness of information	❑	❑	❑
b. Clarity of writing (readability, interpretability)	❑	❑	❑
c. Clarity of presentation (e.g., tables, charts)	❑	❑	❑
d. Timeliness of information	❑	❑	❑
e. Accuracy of information	❑	❑	❑
f. Clarity of technical notes	❑	❑	❑
g. Usefulness of resources and bibliography	❑	❑	❑
h. Organization	❑	❑	❑
i. Length	❑	❑	❑
j. Format	❑	❑	❑

PAPERWORK BURDEN STATEMENT
Office of Educational Research and Improvement (OERI)
Publication Customer Survey

According to the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number. The valid OMB control number for this information collection is 1880–0529. The time required to complete this information collection is estimated to average 10 minutes per response, including the time to review instructions, search existing data resources, gather the data needed, and complete and review the information collection. If you have any comments concerning the accuracy of the time estimate(s), suggestions for improving this form, or concerns regarding the status of your individual submission of this form, write directly to: **P. Quinn, Room 204, Media and Information Services, OERI, U.S. Department of Education, 555 New Jersey Avenue NW, Washington, DC 20208–5570.**

BEST COPY AVAILABLE

OERI Publication Customer Survey

Media and Information Services
555 New Jersey Avenue NW—Rm. 202
Washington DC 20208–5570

OFFICIAL BUSINESS
PENALTY FOR PRIVATE USE, $300

NO POSTAGE
NECESSARY
IF MAILED
IN THE
UNITED STATES

BUSINESS REPLY MAIL

FIRST-CLASS MAIL PERMIT NO. 012935 WASHINGTON DC

POSTAGE WILL BE PAID BY US DEPARTMENT OF EDUCATION

V. Allen
Room 200
Media and Information Services
Office of Educational Research and Improvement
US Department of Education
555 New Jersey Avenue NW
Washington DC 20208–5570

Fold on line—TAPE CLOSED—DO NOT STAPLE

10. Do you have any suggestions regarding the content or format of future editions of this publication or other comments?

MIS 1999-6532

NATIONAL CENTER FOR EDUCATION STATISTICS

Statistical Analysis Report March 2000

1993 National Study of Postsecondary Faculty (NSOPF:93)

Salary, Promotion, and Tenure Status of Minority and Women Faculty in U.S. Colleges and Universities

Michael T. Nettles
University of Michigan

Laura W. Perna
Frederick D. Patterson Research Institute

Ellen M. Bradburn
National Center for Education Satistics

Linda Zimbler
Project Officer
National Center for Education Satistics

U.S. Department of Education
Office of Educational Research and Improvement NCES 2000-173

U.S. Department of Education
Richard W. Riley
Secretary

Office of Educational Research and Improvement
C. Kent McGuire
Assistant Secretary

National Center for Education Statistics
Gary W. Phillips
Acting Commissioner

The National Center for Education Statistics (NCES) is the primary federal entity for collecting, analyzing, and reporting data related to education in the United States and other nations. It fulfills a congressional mandate to collect, collate, analyze, and report full and complete statistics on the condition of education in the United States; conduct and publish reports and specialized analyses of the meaning and significance of such statistics; assist state and local education agencies in improving their statistical systems; and review and report on education activities in foreign countries.

NCES activities are designed to address high priority education data needs; provide consistent, reliable, complete, and accurate indicators of education status and trends; and report timely, useful, and high quality data to the U.S. Department of Education, the Congress, the states, other education policymakers, practitioners, data users, and the general public.

We strive to make our products available in a variety of formats and in language that is appropriate to a variety of audiences. You, as our customer, are the best judge of our success in communicating information effectively. If you have any comments or suggestions about this or any other NCES product or report, we would like to hear from you. Please direct your comments to:

National Center for Education Statistics
Office of Educational Research and Improvement
U.S. Department of Education
555 New Jersey Avenue NW
Washington, DC 20208–5574

March 2000

The NCES World Wide Web Home Page is: ***http://nces.ed.gov***
The NCES World Wide Web Electronic Catalog is: ***http://nces.ed.gov/pubsearch/index.asp***

Suggested Citation
U.S. Department of Education. National Center for Education Statistics. *Salary, Promotion, and Tenure Status of Minority and Women Faculty in U.S. Colleges and Universities*, NCES 2000–173, by Michael T. Nettles, Laura W. Perna, and Ellen M. Bradburn. Project Officer: Linda Zimbler. Washington, DC: 2000.

For ordering information on this report, write:

U.S. Department of Education
ED Pubs
P.O. Box 1398
Jessup, MD 20794–1398

or call toll free 1–877–4ED–Pubs.

Content Contact:
Linda Zimbler
(202) 219–1834

For sale by the U.S. Government Printing Office
Superintendent of Documents, Mail Stop: SSOP, Washington, DC 20402-9328
ISBN 0-16-050303-5

Foreword

This report is one of several publications released from the 1993 National Study of Postsecondary Faculty (NSOPF:93) by the National Center for Education Statistics. NCES is pleased to sponsor analysis of the condition of faculty in higher education institutions. We hope the information in this report will be of interest to the research community and will stimulate discussions on faculty issues.

NCES has plans to publish additional reports from NSOPF:93, since the next new data on faculty will not be available until late 2000 when the results from the 1999 National Study of Postsecondary Faculty (NSOPF:99) will become available. We encourage individuals to keep track of NSOPF publications through our internet site at http://nces.ed.gov/surveys/nsopf/ and through our announcements to the higher education community.

Finally, researchers are strongly encouraged to conduct their own in-depth analysis of the NSOPF data.

C. Dennis Carroll
Associate Commissioner
Postsecondary Studies Division

Andrew G. Malizio
Director
Postsecondary Longitudinal and
Sample Survey Studies Program

Acknowledgments

The authors would like to thank all those who contributed to the production of this report. Linda Zimbler of NCES provided guidance and support throughout the entire process. Statistical consultants Sam Bedinger and Dan Heffron of Pinkerton Computing Consultants, Inc., executed the analysis and offered useful advice on statistical issues.

Many reviewers at NCES and elsewhere improved the report. We are grateful to Paula Knepper for expert technical review and Mike Cohen for his guidance throughout the adjudication process. Helpful comments were also provided by Andrew Malizio, Dennis Carroll, Jonaki Bose, and Roz Korb. Other reviewers from the Department of Education included Patricia W. McNeil from the Office of Vocational and Adult Education, Alex Choi from the Office of Civil Rights, and representatives from the Office of the Deputy Secretary and OMB/Budget Service. We also appreciate the comments of outside reviewers Robert Toutkoushian and Monique Clague.

Executive Summary

This report examines differences among postsecondary faculty members by gender and by race/ethnicity. Comparisons were made on several human capital (e.g., education and experience) and structural (e.g., academic discipline and institution type) variables as well as faculty outcomes (salary, tenure, and rank). A multivariate analysis of factors associated with salary was also conducted. Male faculty in this group were compared to female faculty, and comparisons were also made among four racial/ethnic groups: black, non-Hispanic; white, non-Hispanic; Hispanic; and Asian/Pacific Islander.

Generated from the 1992-93 National Study of Postsecondary Faculty (NSOPF:93), the analyses presented in this report are based on U.S. citizens with faculty status at 2- and 4-year (and above) institutions who indicated that their primary activity in the fall of 1992 was teaching. Most analyses were also restricted to full-time faculty members. NSOPF:93 is the second in a series of surveys on faculty conducted by the U.S. Department of Education, National Center for Education Statistics.

Differences Between Male and Female Faculty Members

There were several differences between male and female faculty members in the levels of various faculty outcomes such as salary and rank. Female full-time faculty averaged lower salaries than male faculty (table 3) by about $10,000 in the fall of 1992. They were also less likely to be tenured (42 versus 66 percent; table 4) or to be full professors (15 versus 39 percent; table 5).

Age, education, and experience also differed by gender among these postsecondary faculty. Female full-time faculty had lower educational levels and less experience than male faculty. For example, about 40 percent of female faculty, compared to 58 percent of male faculty, held a doctorate (table 6), and female faculty averaged three fewer years in their current rank than male faculty did (table 10).

Male and female faculty also engaged in different professional activities. Female full-time faculty spent larger shares of their time in teaching or service activities, and smaller proportions in research or administrative activities, than male faculty (tables 12, 16, 19, and 21). For example, about 51 percent of female full-time faculty spent at least three-quarters of their time in teaching activities, compared to 37 percent of men (table 12); male faculty averaged 15 percent of their time on research activities, compared to 10 percent for female faculty (table 16).

Male and female faculty also worked in different types of locations and fields. Among full-time faculty, women were more likely than men to work in 2-year institutions (33 versus 23 percent), while men were more likely than women to work in research universities (20 versus 14 percent; table 22). Among full-time faculty, men were at least twice as likely as women to teach engineering (6 versus 1 percent), history and philosophy (6 versus 3 percent), physical sciences (7 versus 2 percent), and occupational programs (5 versus 2 percent; table 24).

Many of the human capital and structural characteristics, however, may themselves be associated with faculty outcomes such as salary, so the male-female differences in salary may be accounted for by controlling for such factors. This possibility was explored with a multivariate regression of the relationship of salary to a variety of human capital and structural factors; even when comparing male and female faculty with similar characteristics, however, female full-time faculty had lower average base salaries than their male counterparts (table 26).

Differences Among Racial/Ethnic Groups

The report also considered differences among racial/ethnic groups in these factors. In some cases, these results are easy to summarize. In faculty outcomes, for example, white faculty generally had higher salaries and were more likely to be tenured and to be full professors than black faculty. For other areas, the racial/ethnic differences are more complex and do not demonstrate consistent patterns.

The first area of inquiry was faculty outcomes such as salary, tenure, and rank. Black, non-Hispanic full-time faculty were less likely than white, non-Hispanic faculty members to have higher salaries, tenure, and full professorships (tables 3, 4, and 5). For example, 48 percent of black faculty members compared to 58 percent of white faculty members were tenured in the fall of 1992 (table 4). Asian/Pacific Islander faculty generally had higher salaries and were more likely to be tenured and to be full professors than white, black, or Hispanic faculty. Hispanic faculty did not differ significantly from either whites or blacks on these outcomes.

In terms of human capital characteristics, white and Asian faculty had more experience than black faculty. Black full-time faculty also differed from white faculty in level of education in the fall of 1992. For example, 41 percent of blacks had earned doctorates, compared with 53 percent of whites (table 6). There was some evidence that whites and Asians were also more experienced than their Hispanic counterparts. For example, black and Hispanic full-time faculty were younger, on average, than white and Asian/Pacific Islander full-time faculty. The average age for black and Hispanic faculty was about 47 years old, compared with 49 for white and 50 for Asian/Pacific Islander faculty (table 7).

Among work activities, there were more idiosyncratic differences among racial/ethnic groups. There was some evidence that the teaching load for Asian faculty was different from that of Hispanic faculty, while Asian faculty differed from black faculty in the types of research pursued and the time spent in such activities. Asian/Pacific Islander (78 percent) and non-Hispanic white (64 percent) full-time faculty were more likely than black, non-Hispanic faculty members (51 percent) to be engaged in research or similar scholarly activity (table 15), although the type of activity pursued did not, in general, vary consistently across racial/ethnic groups (table 17). Asian and black faculty were more likely to have no administration time than white faculty (table 19), while white and Hispanic faculty averaged more time on service activities than Asian respondents (table 21).

In structural location there were some differences as well. For example, white faculty (9 percent) were more likely than Asian or Hispanic faculty (5 percent each) to be found in liberal arts colleges, while Hispanic faculty (42 percent) were more likely than white or Asian faculty

(26 and 22 percent, respectively) to teach in 2-year colleges (table 22). Otherwise, the distribution of faculty across institution types generally did not vary by race/ethnicity.

Asian/Pacific Islander faculty were more likely than white, black, or Hispanic faculty to work in engineering or in math/computer science. For example, 16 percent of Asian faculty were in engineering, compared to no more than 6 percent of each of the other groups (table 24). Non-Hispanic black faculty were more likely than white faculty, who in turn were more likely than Asian faculty, to be employed in education (12 percent for blacks versus 7 percent for whites and 3 percent for Asians).

Black full-time faculty were more likely than those from any other racial/ethnic group to work in the Southeast, and Hispanic faculty were more likely than the other three racial/ethnic groups to work in the Southwest. Hispanic and Asian faculty were at least twice as likely as non-Hispanic blacks and whites to work in the far western region of the United States (27 percent each for Hispanic and Asian faculty compared with 8 percent and 13 percent, respectively, for black and white faculty; table 25).

When comparing faculty members with similar human capital characteristics, structural locations, and tenure and rank, faculty of different racial/ethnic groups receive similar salaries. However, as shown above, many differences do exist among faculty of different racial/ethnic groups in such background characteristics and structural location.

Contents

	Page
Foreword	iii
Acknowledgments	iv
Executive Summary	v
List of Tables	x
List of Figures	xv
Section 1: Introduction	1
Prior Research on the Determinants of Faculty Salary, Tenure, and Rank	2
Method	3
Section 2: Representation of Faculty by Gender	5
Salaries	5
Tenure Status	5
Academic Rank	6
Differences in Human Capital	6
Differences in Structural Factors	9
Summary	10
Section 3: Representation of Faculty by Race/Ethnicity	11
Salaries	11
Tenure Status	11
Academic Rank	12
Differences in Human Capital	12
Differences in Structural Factors	15
Summary	16
Section 4: Multivariate Analysis	17
Variable Selection and Creation	17
Results	18
Section 5: Conclusion	21
References	55
Appendix A: Technical Notes	59
Appendix B: Standard Error Tables	77
Appendix C: Additional Data	109

List of Tables

1 Percentage distribution of faculty with U.S. citizenship whose primary responsibility is teaching according to gender, by race/ethnicity: Fall 1992 25

2 Percentage distribution of faculty with U.S. citizenship whose primary responsibility is teaching according to employment status, by gender and race/ethnicity: Fall 1992..... 26

3 Percentage distribution of full-time faculty whose primary responsibility is teaching according to base salary, and average base salary, by gender and race/ethnicity: Fall 1992..... 27

4 Percentage distribution of full-time faculty whose primary responsibility is teaching according to tenure status, by gender and race/ethnicity: Fall 1992 28

5 Percentage distribution of full-time faculty whose primary responsibility is teaching according to academic rank, by gender and race/ethnicity: Fall 1992 29

6 Percentage distribution of full-time faculty whose primary responsibility is teaching according to highest degree attained, by gender and race/ethnicity: Fall 1992 30

7 Percentage distribution of full-time faculty whose primary responsibility is teaching according to age, and average age, by gender and race/ethnicity: Fall 1992..... 31

8a Percentage distribution of full-time faculty whose primary responsibility is teaching according to year received highest degree, and average number of years since receiving highest degree, by gender and race/ethnicity: Fall 1992..... 32

8b Percentage distribution of full-time faculty whose primary responsibility is teaching according to gender and race/ethnicity, by year received highest degree: Fall 1992..... 33

9 Percentage distribution of full-time faculty whose primary responsibility is teaching according to length of time in current job, and average length of time in current job, by gender and race/ethnicity: Fall 1992 34

10 Percentage distribution of full-time faculty whose primary responsibility is teaching according to years in current rank, and average years in current rank, by gender and race/ethnicity: Fall 1992..... 35

11 Percentage distribution of tenured full-time faculty whose primary responsibility is teaching according to years with tenure, and average years with tenure, by gender and race/ethnicity: Fall 1992..... 36

12 Percentage distribution of full-time faculty whose primary responsibility is teaching according to percentage of time spent on teaching activities, and average percentage, by gender and race/ethnicity: Fall 1992 37

List of Tables—Continued

13 Percentage distribution of full-time faculty whose primary responsibility is teaching according to level of instruction, by gender and race/ethnicity: Fall 1992 38

14 Among full-time faculty whose primary responsibility is teaching, average student contact hours per week and classroom hours per week, by gender and race/ethnicity: Fall 1992 39

15 Percentage of full-time faculty whose primary responsibility is teaching who were pursuing research or other scholarly activity, and of those, percentage in funded research, by gender and race/ethnicity: Fall 1992 40

16 Percentage distribution of full-time faculty whose primary responsibility is teaching according to percentage of time spent on research, and average percentage, by gender and race/ethnicity: Fall 1992 41

17 Among full-time faculty whose primary responsibility is teaching and who were pursuing research or other scholarly activity, percentage distribution according to primary type of research activity, by gender and race/ethnicity: Fall 1992 42

18a Among full-time faculty whose primary responsibility is teaching, standardized numbers of various types of scholarly works in the previous two years, by gender and race/ethnicity: Fall 1992 43

18b Among full-time faculty whose primary responsibility is teaching, standardized numbers of various scholarly writings in the previous two years, by gender and race/ethnicity: Fall 1992 44

19 Percentage distribution of full-time faculty whose primary responsibility is teaching according to percentage of time spent on administration, and average percentage, by gender and race/ethnicity: Fall 1992 45

20 Percentage of full-time faculty whose primary responsibility is teaching who chaired their departments, by gender and race/ethnicity: Fall 1992 46

21 Percentage distribution of full-time faculty whose primary responsibility is teaching according to percentage of time spent on service, and average percentage, by gender and race/ethnicity: Fall 1992 47

22 Percentage distribution of full-time faculty whose primary responsibility is teaching according to institution type, by gender and race/ethnicity: Fall 1992 48

List of Tables—Continued

23 Percentage distribution of full-time faculty whose primary responsibility is teaching according to gender, by teaching field: Fall 1992 49

24 Among full-time faculty whose primary responsibility is teaching, percentage distribution according to teaching field, by gender and race/ethnicity: Fall 1992 50

25 Among full-time faculty whose primary responsibility is teaching, percentage distribution according to geographical region, by race/ethnicity: Fall 1992 52

26 Among full-time faculty whose primary responsibility is teaching, regression coefficients for multivariate models of factors associated with base salary: Fall 1992 53

B1 Standard errors for table 1: Percentage distribution of faculty with U.S. citizenship whose primary responsibility is teaching according to gender, by race/ethnicity: Fall 1992 79

B2 Standard errors for table 2: Percentage distribution of faculty with U.S. citizenship whose primary responsibility is teaching according to employment status, by gender and race/ethnicity: Fall 1992 80

B3 Standard errors for table 3: Percentage distribution of full-time faculty whose primary responsibility is teaching according to base salary, and average base salary, by gender and race/ethnicity: Fall 1992 81

B4 Standard errors for table 4: Percentage distribution of full-time faculty whose primary responsibility is teaching according to tenure status, by gender and race/ethnicity: Fall 1992 82

B5 Standard errors for table 5: Percentage distribution of full-time faculty whose primary responsibility is teaching according to academic rank, by gender and race/ethnicity: Fall 1992 83

B6 Standard errors for table 6: Percentage distribution of full-time faculty whose primary responsibility is teaching according to highest degree attained, by gender and race/ethnicity: Fall 1992 84

B7 Standard errors for table 7: Percentage distribution of full-time faculty whose primary responsibility is teaching according to age, and average age, by gender and race/ethnicity: Fall 1992 85

B8a Standard errors for table 8a: Percentage distribution of full-time faculty whose primary responsibility is teaching according to year received highest degree, and average number of years since receiving highest degree, by gender and race/ethnicity: Fall 1992 86

List of Tables—Continued

B8b Standard errors for table 8b: Percentage distribution of full-time faculty whose primary responsibility is teaching according to gender and race/ethnicity, by year received highest degree: Fall 1992 87

B9 Standard errors for table 9: Percentage distribution of full-time faculty whose primary responsibility is teaching according to length of time in current job, and average length of time in current job, by gender and race/ethnicity: Fall 1992 88

B10 Standard errors for table 10: Percentage distribution of full-time faculty whose primary responsibility is teaching according to years in current rank, and average years in current rank, by gender and race/ethnicity: Fall 1992 89

B11 Standard errors for table 11: Percentage distribution of tenured full-time faculty whose primary responsibility is teaching according to years with tenure, and average years with tenure, by gender and race/ethnicity: Fall 1992 90

B12 Standard errors for table 12: Percentage distribution of full-time faculty whose primary responsibility is teaching according to percentage of time spent on teaching activities, and average percentage, by gender and race/ethnicity: Fall 1992 91

B13 Standard errors for table 13: Percentage distribution of full-time faculty whose primary responsibility is teaching according to level of instruction, by gender and race/ethnicity: Fall 1992 92

B14 Standard errors for table 14: Among full-time faculty whose primary responsibility is teaching, average student contact hours per week and classroom hours per week, by gender and race/ethnicity: Fall 1992 93

B15 Standard errors for table 15: Percentage of full-time faculty whose primary responsibility is teaching who were pursuing research or other scholarly activity, and of those, percentage in funded research, by gender and race/ethnicity: Fall 1992 94

B16 Standard errors for table 16: Percentage distribution of full-time faculty whose primary responsibility is teaching according to percentage of time spent on research, and average percentage, by gender and race/ethnicity: Fall 1992 95

B17 Standard errors for table 17: Among full-time faculty whose primary responsibility is teaching and who were pursuing research or other scholarly activity, percentage distribution according to primary type of research activity, by gender and race/ethnicity: Fall 1992 96

List of Tables—Continued

B18a Standard errors for table 18a: Among full-time faculty whose primary responsibility is teaching, standardized numbers of various types of scholarly works in the previous two years, by gender and race/ethnicity: Fall 1992 97

B18b Standard errors for table 18b: Among full-time faculty whose primary responsibility is teaching, standardized numbers of various scholarly writings in the previous two years, by gender and race/ethnicity: Fall 1992 98

B19 Standard errors for table 19: Percentage distribution of full-time faculty whose primary responsibility is teaching according to percentage of time spent on administration, and average percentage, by gender and race/ethnicity: Fall 1992 99

B20 Standard errors for table 20: Percentage of full-time faculty whose primary responsibility is teaching who chaired their departments, by gender and race/ethnicity: Fall 1992 100

B21 Standard errors for table 21: Percentage distribution of full-time faculty whose primary responsibility is teaching according to percentage of time spent on service, and average percentage, by gender and race/ethnicity: Fall 1992 101

B22 Standard errors for table 22: Percentage distribution of full-time faculty whose primary responsibility is teaching according to institution type, by gender and race/ethnicity: Fall 1992 102

B23 Standard errors for table 23: Percentage distribution of full-time faculty whose primary responsibility is teaching according to gender, by teaching field: Fall 1992 103

B24 Standard errors for table 24: Among full-time faculty whose primary responsibility is teaching, percentage distribution according to teaching field, by gender and race/ethnicity: Fall 1992 104

B25 Standard errors for table 25: Among full-time faculty whose primary responsibility is teaching, percentage distribution according to geographical region, by race/ethnicity: Fall 1992 106

B26 Standard errors for table 26: Among full-time faculty whose primary responsibility is teaching, regression coefficients for multivariate models of factors associated with base salary: Fall 1992 107

C1 Among full-time faculty whose primary responsibility was teaching, average numbers of various types of scholarly works, by academic field: Fall 1992 111

List of Figures

1 Average base salary of full-time faculty whose primary responsibility is teaching, by gender and race/ethnicity: Fall 1992 23

2 Percentage distribution of full-time faculty whose primary responsibility is teaching according to highest degree attained, by gender and race/ethnicity: Fall 1992 24

Salary, Promotion, and Tenure Status of Minority and Women Faculty in U.S. Colleges and Universities

Section 1: Introduction

Gender and race/ethnicity differences in faculty salaries—and in the distribution of tenure and academic rank (level of appointment), which are primary determinants of salary (e.g., Smart 1991; Broder 1993)—have been prominent policy issues for the past two decades. Economic theories of human capital suggest that faculty salaries (and other outcomes such as tenure and rank) are primarily determined by an individual's qualifications, including their level of educational attainment, length of service and experience, scholarly productivity, amount of administrative responsibilities, and teaching performance. An institutional or structural view of labor markets would suggest that faculty outcomes are also influenced by such variables as the type of institution and the academic field in which the faculty member works.

Either perspective would conclude that faculty who are equal in these attributes of human capital and who work in comparable disciplines and institutions would have equivalent tenure and rank and receive equal pay regardless of their gender or their race/ethnicity. In other words, gender and racial/ethnic differences in salaries, tenure, and rank are expected, from these perspectives, to reflect gender and racial/ethnic differences in the amounts of experience and education, levels of productivity, types of responsibilities, and types of academic disciplines and institutions in which people work. In their synthesis of the research literature on gender and race/ethnicity equity among college and university faculty, however, Moore and Amey (1993) found evidence that gender and racial/ethnic differences in salary and rank are not completely and consistently explained by experience, productivity, and performance (i.e., human capital factors) or by institutional type or academic discipline (i.e., structural factors).

Much of the published research that examines gender and racial/ethnic differences in faculty salaries, rank, and tenure focuses upon faculty of the 1970s and 1980s, but not faculty of the 1990s. The 1992–93 National Study of Postsecondary Faculty (NSOPF:93) provides the most up-to-date record of the level of faculty equity in the United States.

This report begins by reviewing prior research that has examined predictors of faculty salaries, tenure, and rank. Section 2 describes how men and women are represented, paid, promoted, and tenured among America's college and university faculty. Two broad categories of variables which may contribute to the observed disparities are then examined: human capital characteristics, including education, experience, and types of responsibilities; and structural characteristics, such as institutional type and academic discipline. Section 3 presents the representation of individuals of different racial/ethnic groups among America's college and university faculty and compares different racial/ethnic groups by salary level, tenure status, and academic rank. Again, human capital and structural characteristics are examined for variation among faculty of various racial/ethnic groups. Section 4 presents a multivariate analysis of variables associated with faculty salaries and examines whether, holding these variables constant, gender and racial/ethnic differences remain. Section 5 concludes by summarizing the results and discussing some limitations of the study.

Prior Research on the Determinants of Faculty Salary, Tenure, and Rank

Two approaches to the labor market have been used to examine the predictors of salaries, tenure, and rank. Neoclassical economic theories about the labor market suggest that labor, as a commodity, is subject to the laws of supply and demand (Kelly and Bayes 1988; Youn 1988; England 1992). According to these theories, faculty wages should reflect faculty productivity. Productivity is a general concept that is difficult to define in operational terms in a way that reflects the supply of and demand for faculty trained in a given discipline. The number of publications, the size of teaching load, and the amount of administrative and service responsibilities are often used as indicators of this concept. Differences in productivity are expected to be attributable to variations in individual qualifications, such as level of education, amount of training, years of experience, work history, and personal health. Therefore, wage disparities among faculty within a discipline may be due to variations in the amount of training or education, and wage disparities among faculty across disciplines may be due to differences in the supply of and demand for faculty trained in each discipline.

A structural approach, on the other hand, focuses upon the effects on faculty outcomes of organizational and structural characteristics, such as institutional attributes and practices. According to Youn (1988), institutions establish internal labor markets that are defined by administrative rules and procedures, such as a tenure system and a policy of equitable wages across disciplines, regarding the distribution of jobs and an individual's progression within and between jobs. Structural theorists expect that gender differences in employment outcomes are primarily due to the segregation of women in institutions, academic disciplines, and work roles that are perceived to have lower prestige and lower value (Smart 1991).

Research on faculty equity has generally focused upon differences in salaries rather than upon differences in tenure status and rank. A few researchers (e.g., Raymond, Sesnowitz, and Williams 1988; Formby, Gunther, and Sakano 1993) have found that, after controlling for sociodemographic characteristics, human capital, productivity, and characteristics of current employment, female and male faculty receive comparable salaries. Nonetheless, most researchers (Astin and Bayer 1972; Katz 1973; Johnson and Stafford 1974; Gordon, Morton, and Braden 1974; Hoffman 1976; Loeb, Ferber, and Lowry 1978; Ferber and Kordick 1978; Braskamp, Muffo, and Langston 1978; Ferber and Green 1982; Gregorio, Lewis, and Wannter 1982; Hirsch and Leppel 1982; Barbezat 1988; Weiler 1990; Bellas 1993; Langton and Pfeffer 1994; Toutkoushian 1998) have shown that controlling for these variables reduces but does not completely account for the gaps in the salaries of men and women faculty. Prior research generally shows that female faculty continue to average lower salaries than male faculty.

Gender differences in faculty salaries have been found to be due to differences in the reward systems that are applied to men and women (Ferber, Loeb, and Lowry 1978; Tuckman 1979; Jusenius and Scheffler 1981; Barbezat 1988; Weiler 1990; Bellas 1993). Tuckman (1979) showed that, on average, male faculty received greater rewards than female faculty for publishing books, engaging in public service, and taking on administrative responsibilities. Bellas (1993) found that spending more time on research than teaching produced higher salaries for men faculty but not for women faculty. Controlling for other factors such as institution type and

faculty rank, women spent a greater proportion of time than men on teaching, a smaller proportion of time in research, and about the same amount of time in service activities (Bellas and Toutkoushian 1999).

Some of the observed male-to-female wage gap has been attributed to differences in the rank held by men and women faculty. Hoffman (1976), Loeb et al. (1978), Astin and Bayer (1979), Hirsch and Leppel (1982), Weiler (1990), and Broder (1993) have all shown that women hold lower ranks than men after controlling for such attributes as education, experience, and productivity and that rank is the single most important predictor of faculty salaries (Smart 1991; Broder 1993).

Cox and Astin (1977), Barbezat (1988), and Bellas (1994) have also shown that average salaries are lower for faculty working in institutions and disciplines (e.g., nursing, teacher education) with higher proportions of women faculty than for faculty working in institutions and disciplines with lower proportions of women. Institutional characteristics have been found to be related to faculty salaries, with higher salaries associated with more selective institutions (Cox and Astin 1977; Astin and Bayer 1972), larger institutions (Cox and Astin 1977; Tolbert 1986), institutions with larger percentages of graduate students (Cox and Astin 1977), and more affluent institutions (Tolbert 1986; Cox and Astin 1977).

Little is known about differences in faculty outcomes among faculty of different racial/ethnic groups. National surveys of faculty in 1969 revealed that black faculty received lower salaries than white faculty (Barbezat 1988). Later surveys demonstrated that black faculty received higher salaries than white faculty in the early 1970s (Gordon et al. 1974; Hoffman 1976; Tuckman and Tuckman 1976; Gregorio et al. 1982). In one of the most recent examinations, Toutkoushian (1998) found, using the 1992–93 National Study of Postsecondary Faculty (NSOPF:93), that average salaries were between 4 and 6 percent higher for black women than for white women after controlling for human capital, institutional characteristics, academic field, and publications. While Asian Pacific Americans are often thought to be well- or over-represented in higher education institutions, there is some evidence of a more complicated picture dependent on factors such as academic rank (Nakanishi 1993). Nonetheless, most examinations of differences by race/ethnicity in salaries have been limited by inadequate numbers of faculty of color in the sample and the practice of aggregating all non-white faculty into one group of minorities (e.g., Bellas 1993; Fairweather 1993).

Method

This analysis is based upon the 1992–93 National Study of Postsecondary Faculty (NSOPF:93). NSOPF:93 is a nationally representative sample of college and university faculty and instructional staff who were employed by public and private not-for-profit higher education institutions in the fall of 1992. NSOPF:93 includes data and information about the professional backgrounds of faculty, as well as their duties, workloads, salaries, benefits, and attitudes. The study was sponsored by the U.S. Department of Education's National Center for Education Statistics (NCES) and supported by the National Science Foundation and the National Endowment for the Humanities. The National Opinion Research Center at the University of

Chicago, under contract to NCES, conducted NSOPF:93. For more information about the study, consult the *1993 National Study of Postsecondary Faculty (NSOPF-93): Methodology Report* (Selfa et al. 1997).

For these analyses, the NSOPF:93 population was limited to U.S. citizens with faculty status whose primary activity was teaching in 2- and 4-year colleges and universities.[1] Because there were too few American Indian/Alaskan Native faculty in the sample to draw reliable conclusions, the analysis of different racial/ethnic groups is limited to four groups—Asian/Pacific Islander; black, non-Hispanic; Hispanic; and white, non-Hispanic[2]—although estimates for American Indian/Alaskan Native faculty are provided in the tables for descriptive purposes. All differences cited in this report are significant at the .05 level.[3] For additional information about the statistical methods used in this study, consult the Technical Notes in appendix A. Standard errors for tables in this report are found in appendix B.

---

[1] Applying the selection criteria described above, this analysis estimates the total number of faculty in the population in the fall of 1992 at 605,224. This represents 59 percent of the 1,033,966 faculty and instructional staff represented by the NSOPF:93 faculty survey. Excluded, therefore, are 428,742 faculty and instructional staff who did not meet one or more of these criteria. Other NCES reports using NSOPF:93 may have different inclusion criteria; thus, it is important for the reader to note what subgroup of faculty and instructional staff are included in any particular NSOPF:93 report.

[2] For brevity, this report also uses "Asian" to refer to Asian/Pacific Islander faculty; "black" to refer to black, non-Hispanic faculty; and "white" to refer to white, non-Hispanic faculty.

[3] In accordance with NCES standards, the Bonferroni adjustment to the significance level was used when multiple comparisons were made. With this adjustment, the .05 significance level was divided by the total number of comparisons made within a family of comparisons among subgroups. Consequently, the t-value required for statistical significance among multiple comparisons is considerably more rigorous than the 1.96 t-value required for a single comparison. See the *Technical Notes* for a description of accuracy of estimates.

Section 2: Representation of Faculty by Gender

In 1992, women represented 51 percent of the U.S. population (U.S. Bureau of the Census 1998). In the fall of that year, women comprised 39 percent of all faculty whose primary activity was teaching (table 1).[4]

In the fall of 1992, women comprised a higher share of black faculty than of faculty of other racial/ethnic groups. Table 1 shows that about one-half (50 percent) of black faculty were women, compared with 39 percent of white faculty, 35 percent of Hispanic faculty, and 31 percent of Asian/Pacific Islander faculty.

About three out of five (60 percent) faculty whose primary activity was teaching were employed full time in the fall of 1992, and 40 percent were employed part time. Table 2 shows that a smaller share of women than men (54 versus 63 percent[5]) were employed full time. The remainder of this section focuses on characteristics of male and female full-time faculty in the fall of 1992 whose primary activity was teaching.[6] Section 3 below focuses on characteristics of the same group of faculty by racial/ethnic group.

Section 1 presented evidence that differences in faculty salaries persisted since the 1970s through the most recent reports. Consistent with this literature, the NSOPF:93 data used here show significant differences for all three faculty status variables: salaries, tenure status, and academic rank.

Salaries

In fall 1992, full-time female faculty averaged lower salaries than male faculty (figure 1). Table 3 shows that 66 percent of women earned base salaries of less than $40,000, compared with 37 percent of men. In contrast, while 5 percent of women reported salaries of $60,000 or more, 19 percent of men did so.

Tenure Status

A smaller share of women than men held tenured positions among full-time faculty (42 versus 66 percent; table 4). Furthermore, a higher percentage of women than men were not on a tenure track (13 versus 6 percent) or worked in institutions with no tenure system (18 versus 10 percent). Thus, women were not only less likely to have tenure, they were also more likely to be employed in positions that would not lead to tenure. However, a higher percentage of women were on a tenure track but not tenured (28 versus 18 percent).

---

[4] For an analysis of the relative representation of women among faculty members, see Toutkoushian (forthcoming).

[5] Percentages in the text may differ slightly from those in the tables because they are rounded to different numbers of digits.

[6] See footnote 1. Most of the analyses in this report are further restricted to full-time faculty, an estimated 361,963, or 60 percent, of all faculty included in this report.

Academic Rank

As indicated in section 1, academic rank or level of appointment has been shown to be a consistent predictor of salary (e.g., Smart 1991; Broder 1993). The percentage of female full-time faculty who held the rank of full professor was less than half the percentage of men (15 versus 39 percent, respectively; table 5). Women were more likely than men to hold the lower ranks of assistant professor, instructor, and lecturer. For example, table 5 shows that 32 percent of women, but 18 percent of men, held the rank of assistant professor, and 22 percent of women compared to 13 percent of men were instructors.

Differences in Human Capital

This section examines differences between male and female full-time faculty in terms of many aspects of human capital, which neoclassical economic theorists expect to account for faculty outcomes such as salary (Kelly and Bayes 1988; England 1992). Educational attainment is one of the primary indicators of human capital. Amount of experience is another widely agreed upon aspect of human capital; in this report, age, year the respondent received their highest degree, the number of years in current job and rank, and the number of years tenured faculty have been tenured are used as indicators of experience. Other human capital characteristics considered here reflect the duties faculty members might fulfill, including teaching responsibilities, research activities, administrative duties, and amount of time spent on service activities. In virtually every category of human capital considered in this report, women and men differed.

Educational Attainment

Full-time female faculty had completed lower levels of education than men, on average (figure 2). Table 6 shows that 40 percent of women held doctorate degrees, compared with 58 percent of men. Conversely, for nearly one-half (48 percent) of women, compared with 27 percent of men, the highest level of education attained was a master's degree.

Experience

Several approximate indicators of experience were available in NSOPF:93, including age, length of time since receiving the highest degree, and length of time in current job, at the current rank, and since receiving tenure (if tenured). Across all indicators, women exhibited less experience as faculty than men.

Female full-time faculty were younger, on average, than their male counterparts (46 versus 50 years old). Table 7 shows that 9 percent of women were under the age of 35, compared with 6 percent of men. Eighteen percent of women were age 55 or older, compared with about one-third (34 percent) of men. However, people of the same age do not necessarily have the same amount of experience, and this may differ systematically by gender if women and men are not equally likely to change careers or start a career later in life. Thus, other indicators are of interest.

The length of time elapsed since receiving the highest degree may indicate the amount of time a faculty member has been working at a level commensurate with his or her training, though this too is an approximation and tends to give an upper limit on relevant experience. Women received their highest degrees more recently than men, on average (table 8a). More than one-half (54 percent) of female faculty received their highest degrees between 1981 and 1992, compared with less than one-third (29 percent) of male faculty. On the other hand, men were more than twice as likely as women to have received their highest degree prior to 1971 (36 versus 15 percent, respectively).

The proportion of full-time faculty who were women increased with the year in which they received their highest degree (table 8b). In fact, women comprised a greater proportion of full-time faculty who received their highest degrees in 1981 or later than of faculty overall (50 versus 35 percent).

People who have had the same degree for the same amount of time may not have been working at their present institution for the entire time. Thus, the length of time spent in one's current position at the current institution is another way to indicate experience. Women have spent less time in their current jobs than men. Table 9 shows that 22 percent of women, but 41 percent of men, have held their current jobs for 16 or more years. Women are more likely than men to have held their current jobs for five or fewer years (45 percent of women compared to 29 percent of men).

Of course, length of time in the current job is not the same as the length of time in a given academic rank. Women have held their current academic rank for fewer years than men, on average. Table 10 shows that 61 percent of women, but 42 percent of men, have held their current academic rank for five years or less. Men were more than twice as likely as women to have held their current ranks for 16 or more years (21 percent versus 9 percent, respectively).

Finally, among faculty with tenure, women have been tenured for a shorter period of time than men, on average. Table 11 shows that 33 percent of tenured women have been tenured for five or fewer years, compared with 20 percent of tenured men. About 24 percent of women, compared to 45 percent of men, have been tenured for 16 or more years.

In short, a variety of indicators of experience in the faculty role were examined for male and female faculty, and on each indicator, women had less experience than men in the fall of 1992.

Teaching Responsibilities

The NSOPF provides a wealth of information about the job experiences of faculty members, including such aspects of their teaching responsibilities as the percentage of time spent in teaching activities,[7] level of instruction, number of classroom hours per week, and number of contact hours with students per week.

[7] In addition to classroom time, teaching activities include such tasks as grading, course preparation, and advising students.

Women spent more of their time on teaching activities than men, on average. Table 12 shows that 51 percent of women, but 37 percent of men, allocated at least 75 percent of their time to teaching activities.[8] While 16 percent of women spent less than 50 percent of their time on teaching activities, 24 percent of men did so.

Previous research suggests that teaching graduate courses may be rewarded more than teaching at the undergraduate level (Fairweather 1993). The percentage of women teaching exclusively at the undergraduate level was higher than the percentage of men (81 versus 72 percent, respectively; table 13). Furthermore, women were less likely than men to teach at both the undergraduate and graduate levels: 10 percent of women taught at both levels, compared with 16 percent of men.

Women and men averaged similar numbers of student contact hours of instruction (number of hours per week spent teaching for-credit classes by the number of students in those classes) and of classroom credit hours per week. For example, table 14 shows that both women and men averaged about 10 classroom credit hours of instruction per week.

Research Activities

Some researchers have argued that most faculty reward systems are based on research performance (Hansen 1988), and existing research supports this assertion (e.g., Fairweather 1995, 1996; Gomez-Mejia and Balkin 1992; Ferber and Green 1982; Lewis and Becker 1979; Tuckman and Hageman 1976). Nearly two-thirds (64 percent) of full-time faculty reported that they engaged in some research, writing, or other creative work (table 15). Nonetheless, a smaller percentage of full-time women than men engaged in some type of research (58 percent versus 67 percent). Female faculty also spent less time on research, on average, than male faculty. Table 16 shows that 32 percent of women, but 25 percent of men, spent no time on research.[9] And while 27 percent of women spent more than 10 percent of their time on research, 43 percent of men did so.

In addition to being more likely to conduct research, male faculty were also more likely to engage in research that was *funded* by another source. Table 15 shows that, among faculty doing research, 31 percent of full-time faculty engaged in funded research. Among those doing research, however, 27 percent of women, compared with 33 percent of men, reported having conducted funded research.

---

[8] As indicated above, the faculty included in this analysis are those who indicated that their primary activity was teaching.

[9] The question for which responses are shown in table 15 asked respondents whether or not they were engaged in research in the fall of 1992. A different question asked respondents to allocate their work time into percentage of time spent in each of several categories, one of which was "Research/Scholarship." Because the two questions were asked separately, some respondents may have given answers that appear inconsistent: research activities may have been allocated into a different category (such as "Professional Growth"), or some research activities may not have been considered "work time" by the respondents. Thus, the percentage of respondents who did not indicate any research in the fall of 1992 (table 15) is not identical to the percentage who indicated that they spent zero percent of their work hours on research/scholarship (table 16).

The most common types of research, among those pursuing research or other scholarly activity, were pure or basic research and applied research (table 17). Even participation in some types of research activities differed for women and men. A smaller share of women than men engaged in pure or basic research (22 versus 32 percent) or applied research (25 versus 29 percent). Women were more likely than men, however, to report literary work (17 percent of women versus 14 percent of men) and program design or development (20 percent versus 11 percent).

Because the type of research product may vary by academic discipline, the average research productivity of full-time faculty was standardized by teaching field. After standardizing by academic discipline,[10] tables 18a and 18b show that, compared to men, in the two years before the survey in fall of 1992, women averaged fewer articles in refereed (0.77 versus 1.12) and non-refereed journals (0.74 versus 1.13), textbooks (0.72 versus 1.15), and monographs (0.71 versus 1.16).

In summary, women were less likely than men to be engaged in research, particularly in funded research. Moreover, female faculty differed from male faculty in the types of research and research products resulting from their efforts.

Administrative Duties and Service Activities

Administrative responsibilities have been shown to be associated with higher salaries among faculty in previous research (Tuckman 1979; Fairweather 1993). Among full-time faculty in fall 1992, women spent less time than men on administration, on average. Table 19 shows that 50 percent of women spent no time on administration, compared with 42 percent of men. Further, women were less likely than men to chair departments: table 20 shows that 13 percent of full-time faculty chaired their departments, but women were less likely than men to have done so.

On the other hand, a higher percentage of women than men spent some time on service activities (59 versus 53 percent,[11] table 21). Tuckman (1979) has observed that service activities may lead to faculty rewards, at least in some academic fields; for example, he found salary increases associated with public service for most social science fields, but no association in English.

Differences in Structural Factors

Cox and Astin (1977), Barbezat (1988), and others have shown that salaries of faculty members are associated with their structural location, as defined by features that distinguish among various institutions or roles within institutions. This section presents differences between men and women full-time faculty in terms of two structural factors: 1) institutional type and 2) academic

[10] The standardized number of published articles in refereed journals for each faculty member was calculated by dividing the number of articles in refereed journals for that faculty member by the mean number of articles for all faculty teaching in the same academic discipline. Unstandardized numbers for full-time faculty by field are shown in appendix table C1.

[11] These percentages were calculated by subtracting the percentages who said they spent *no* time on service activities, shown in table 21, from 100 percent.

discipline. There were significant differences between male and female faculty in their distributions across both characteristics.

Institutional Type

Nearly one-fifth (18 percent) of full-time faculty worked in the nation's research universities, 11 percent worked in doctoral institutions, 29 percent in comprehensive colleges, 9 percent in liberal arts colleges, and 27 percent in 2-year colleges (table 22). Women were more likely than men to work in 2-year institutions (33 versus 23 percent), while men were more likely than women to work in research universities (20 versus 14 percent).

Teaching Field

Relative to their representation among full-time faculty,[12] women were more likely to be found in nursing (98 percent of all full-time nursing faculty were women), English and foreign languages (52 percent women), and education (50 percent women; table 23). Women were less likely to be found among full-time faculty teaching engineering (6 percent women), physical sciences (13 percent women), occupational programs (16 percent women), history and philosophy (21 percent women), biological sciences (28 percent women), mathematics and computer sciences (27 percent women), and the social sciences (26 percent women). In fact, men were at least twice as likely as women to teach history and philosophy (6 versus 3 percent; table 24), occupational programs (5 versus 2 percent), physical sciences (7 versus 2 percent), and engineering (6 versus 1 percent).

Summary

In this section, we have shown consistent differences between men and women full-time faculty in human capital and structural attributes—ranging from education, experience, and job responsibilities to the type of institution and academic discipline in which faculty are engaged. We have also observed that male faculty receive higher salaries and that higher percentages of men than women have tenure or hold the highest academic rank. Thus, differences between male and female faculty found in earlier studies are also evident when examined with data from NSOPF:93. The next section focuses on comparisons of the same factors across racial/ethnic groups.

[12] Thirty-five percent of full-time faculty were female.

Section 3: Representation of Faculty by Race/Ethnicity

Data from NSOPF:93 indicate that the representation of teaching faculty[13] by race/ethnicity differs in some ways from their overall representation in the U.S. population. Black, non-Hispanic faculty members comprised 5 percent of faculty in the fall of 1992 (table 1), but 12 percent of the U.S. population (U.S. Bureau of the Census 1998). Hispanic respondents comprised 2 percent of faculty in the same year, but 10 percent of the U.S. population, and white[14] faculty comprised 89 percent of all faculty, compared with 75 percent of the population. Asian/Pacific Islander faculty members were a similar share of faculty as of the population (about 3 percent of each).

As noted in section 2, about three in five faculty whose primary activity was teaching were employed full time in the fall of 1992 (table 2). The percentage of faculty employed full time was similar across race/ethnicity; between 54 and 65 percent of faculty in each racial/ethnic group were employed full time (table 2). The remainder of this section focuses on full-time faculty whose primary activity was teaching in the fall of 1992.

Salaries

On average, base salaries were higher for Asian/Pacific Islander faculty, but lower for non-Hispanic black faculty, than for non-Hispanic white faculty (figure 1). Asian full-time faculty were more likely than black and Hispanic faculty to receive a base salary of at least $60,000 (table 3). About one-fifth (22 percent) of Asian/Pacific Islander faculty reported salaries of $60,000 or more, compared with about one-tenth of Hispanic faculty and black faculty (11 percent and 10 percent, respectively). Black, white, and Hispanic faculty members were all more likely than Asian/Pacific Islanders to receive a salary of less than $40,000. Whites were less likely than blacks to receive a salary at this lower end of the salary scale.

Tenure Status

As shown in table 4, the proportion of non-Hispanic black faculty with tenured positions (48 percent) was smaller than the proportion of white faculty (58 percent). But the percentage of Asian/Pacific Islanders with tenure was higher than that for each of the other groups (69 percent for Asian/Pacific Islanders versus 58, 48, and 51 percent for white, black, and Hispanic faculty, respectively). Asian/Pacific Islander and white faculty were less likely than black and Hispanic faculty to be on a tenure track but not tenured. About three in ten black faculty (30 percent) and Hispanic faculty (32 percent) were on a tenure track but were not tenured, compared with 21 percent of white faculty and 17 percent of Asian/Pacific Islander faculty.

---

[13] As noted above, "faculty" refers to the population in higher education institutions who were U.S. citizens and who were faculty with teaching as their primary activity in the fall of 1992.

[14] As noted above, "Asian" is also used in place of Asian/Pacific Islander, "black" for black, non-Hispanic, and "white" for white, non-Hispanic.

Academic Rank

Race/ethnicity was also associated with academic rank. Table 5 shows that 21 percent of blacks held the rank of full professor, compared with 31 percent of whites and 40 percent of Asian/Pacific Islanders. In fact, Asian/Pacific Islander faculty members were also more likely than whites and Hispanics (26 percent) to hold full professorships. Furthermore, black, non-Hispanic faculty were more likely than whites to be found at the rank of instructor (23 versus 15 percent, respectively). The estimates of the proportions of Hispanic faculty at full professor and instructor levels were not significantly different from the estimates for either non-Hispanic black or white faculty.

Differences in Human Capital

This section examines differences among full-time faculty of different racial/ethnic groups in terms of the following aspects of human capital: 1) educational attainment; 2) experience, including their age, year they received their highest degree, and the number of years in their current position and rank, and the number of years tenured faculty have been tenured; 3) teaching responsibilities; 4) research activities; 5) administrative duties; and 6) amount of time spent on service activities.

Educational Attainment

In general, educational attainment levels were lower for black faculty, but higher for Asian/Pacific Islander faculty, than for white faculty (figure 2). Table 6 shows that 41 percent of blacks had earned doctorates, compared with 53 percent of whites and 62 percent of Asian/Pacific Islanders. The proportion of Hispanic faculty with doctorates was not significantly different from either white or black respondents, though they were less likely than Asian faculty to hold doctorates. The master's degree was the highest level of education attained by 45 percent of blacks, compared to 34 percent of whites and 22 percent of Asian/Pacific Islanders.

Experience

As described in section 2, the amount of experience a given faculty member can be assessed in many dimensions of relevant training and time in the job. Across all indicators employed in this study, non-Hispanic whites had more experience than non-Hispanic black faculty.

Black and Hispanic full-time faculty were younger, on average, than white and Asian/Pacific Islander full-time faculty. Table 7 shows that the average age for black and Hispanic faculty was about 47 years old, compared with 49 for white and 50 for Asian/Pacific Islander faculty.

Furthermore, black faculty received their highest degrees more recently than white and Asian/Pacific Islander faculty (table 8a). While 47 percent of blacks received their highest degrees between 1981 and 1992, 38 percent of whites and 30 percent of Asian/Pacific Islanders did so. Hispanic and black faculty were less likely than white faculty to have received their highest degrees before 1971 (18 and 16 versus 29 percent).

Compared to full-time faculty who received their highest degrees before 1971, those who received their degrees after 1980 were less likely to be white, non-Hispanic, and were more likely to be black or Hispanic (table 8b). However, the distribution of more recent degree recipients was similar to the distribution of all full-time faculty, except for Asian faculty who were slightly underrepresented among recent degree recipients compared to all faculty. Whites were a greater proportion of recent degree recipients than of the population, while a smaller share of recent degree recipients than the general population were black or Hispanic.

Black and Hispanic faculty have held their current positions for fewer years than white faculty, on average (table 9). Black faculty members were more likely than white faculty to have held their current jobs for five or fewer years (41 versus 34 percent), and less likely to have held their current jobs for more than 15 years (28 versus 35 percent). About 25 percent of Hispanic faculty, compared with 35 percent of white faculty, have held their current positions for more than fifteen years.

Narrowing the definition of experience still further, we see that black faculty have held their current ranks for a shorter period of time than white faculty (table 10). While 56 percent of black faculty have held their current academic ranks for five years or less, 48 percent of white faculty and 43 percent of Asian/Pacific Islander faculty have done so. At the other end of the scale, about 17 percent of white faculty have held their current ranks for more than 15 years, compared to 12 percent of black faculty. Estimates for Hispanic faculty were not significantly different from the other racial/ethnic groups, however.

Finally, among tenured faculty, 40 percent of non-Hispanic whites, but 31 percent of non-Hispanic blacks, have been tenured for more than fifteen years (table 11).

Thus, blacks and whites in this study differ on all indicators of experience. Asian/Pacific Islander faculty also appear to have more experience than black faculty on most indicators shown here. There was some evidence that white and Asian faculty have more experience than Hispanic faculty, but this was not conclusive across all indicators. There were few differences between white and Asian faculty members in these indicators of experience, and no significant differences between black and Hispanic faculty members.

Teaching Responsibilities

Few dimensions of teaching varied among faculty of different racial/ethnic groups. The percentage of time spent on teaching activities was comparable across racial/ethnic categories; for example, roughly two-fifths of faculty in the four racial/ethnic groups whose primary activity was teaching spent more than 75 percent of their time in teaching activities (table 12). Furthermore, white faculty were not significantly different from other groups in terms of the level of instruction. Nonetheless, Asian/Pacific Islander faculty (68 percent) were less likely than black and Hispanic faculty (79 and 81 percent, respectively) to teach solely at the undergraduate level (table 13).

There were few differences in for-credit weekly student contact hours (number of hours per week spent teaching for-credit classes by the number of students in those classes) or classroom hours, although Asian/Pacific Islander faculty spent fewer hours in the classroom in for-credit courses than Hispanic faculty, on average (table 14).

Research Activities

As described earlier, research activity and productivity are often rewarded with higher salary or greater likelihood of promotion (Fairweather 1995, 1996; Mejia and Balkin 1992; Gerber and Green 1982; Lewis and Becker 1979; Tuckman and Hagemann 1976). Across the different dimensions of research activity assessed here, Asian/Pacific Islander faculty conducted more research, in general, at least compared to non-Hispanic blacks and whites.[15]

Asian/Pacific Islander (78 percent) and non-Hispanic white (64 percent) faculty were more likely than black, non-Hispanic faculty members (51 percent) to be engaged in research or similar scholarly activity (table 15). While Asian/Pacific Islander faculty were more likely than white faculty to be involved in funded research (43 versus 30 percent), no other racial/ethnic differences in funded research participation were evident.

Asian/Pacific Islander faculty spent more time on research than both white and black faculty (table 16). About half (50 percent) of Asian/Pacific Islanders spent more than 10 percent of their time on research, compared with 37 percent of whites and 32 percent of blacks. There was some evidence that white faculty members may be more likely than black faculty members to spend more than 10 percent of their time on research activities.[16]

The type of research activity pursued by those faculty doing research generally did not vary across racial/ethnic groups (table 17). Asian/Pacific Islander faculty were more likely than non-Hispanic black faculty to participate in applied research, less likely than this group to conduct policy research, and less likely than white or Hispanic faculty to be involved in literary work.

After standardizing by academic discipline,[17] the numbers of most recent research products did not vary by racial/ethnic group (tables 18a and 18b). Overall, however, white faculty were more likely than black faculty to have produced at least one research product in the past two years (60 percent of whites and 52 percent of blacks did so).[18]

---

[15] While there appear to be differences between Asian and Hispanic faculty as well, there was not enough evidence to conclude that these groups were statistically different.

[16] This difference was significant at the 0.10 level, not the conventional 0.05 level.

[17] Because the type of research product may vary by academic discipline, the average research productivity of full-time faculty was standardized by teaching field. The standardized number of published articles in refereed journals for each faculty member was calculated by dividing the number of articles in refereed journals for that faculty member by the mean number of articles for all faculty teaching in the same academic discipline. Unstandardized numbers for full-time faculty by field are shown in appendix table C1.

[18] Not shown in table; U.S. Department of Education, National Center for Education Statistics, 1992-93 National Study of Postsecondary Faculty.

Administrative Duties and Service Activities

In general, the amount of time spent on administration by faculty of each racial/ethnic group was comparable, although Asian and black faculty were less likely than white faculty to spend time on administration (table 19). Members of each racial/ethnic group were also about equally likely to chair their departments in fall of 1992 (table 20). Hispanic and white faculty averaged more time on service activities than Asian faculty (table 21).

Differences in Structural Factors

This section presents differences among full-time faculty of different racial/ethnic groups in terms of three structural factors: 1) institutional type; 2) academic discipline; and 3) geographic region.

Institutional Type

The distribution of faculty across institution types generally did not vary by race/ethnicity. However, non-Hispanic white faculty were more likely to work at liberal arts colleges than Asian/Pacific Islander or Hispanic faculty (9 percent versus about 5 percent each, respectively; table 22). About two-fifths (42 percent) of Hispanic faculty worked at 2-year institutions, compared to roughly one-quarter of white or Asian faculty (26 and 22 percent, respectively). While data in table 22 may suggest that whites and Asians were more likely than other groups to work at research universities, there was not enough statistical evidence to conclude that this was the case.

Teaching Field

The proportions of faculty teaching in various academic fields varied in some cases by racial/ethnic group (table 24). For example, non-Hispanic black faculty were more likely than white faculty to be in education (12 versus 7 percent), and both blacks and whites were more likely than Asian/Pacific Islander faculty (3 percent) to be in this field. However, Asians were more likely than blacks, Hispanics, and whites to work in either engineering or mathematics and computer science. Hispanic faculty were more likely than those in each of the other three racial/ethnic groups to be in English or foreign language fields.

Geographic Region

Due to differences in patterns of migration to and within this country, the concentration of different racial/ethnic groups varies across regions (U.S. Bureau of the Census 1996). Thus, geographic region is a structural characteristic that may be related to racial/ethnic differences in faculty outcomes.

The distribution of faculty by racial/ethnic group varied by geographic region. Blacks were more likely than any other racial/ethnic group to work in the Southeast, with nearly one-half (47 percent) of black faculty, but no more than one-quarter of white, Asian/Pacific Islander, or

Hispanic faculty (24, 19, and 19 percent, respectively), working in this region (table 25). Hispanic and Asian faculty were at least twice as likely as non-Hispanic blacks and whites to work in the far western region of the United States (27 percent each for Hispanic and Asian faculty, compared with 8 percent and 13 percent, for black and white faculty, respectively). An additional 25 percent of Hispanic faculty worked in the southwestern region, compared with about 9 percent each of Asian/Pacific Islander, white, and black faculty.

Summary

This section has compared differences across racial/ethnic groups in the characteristics of instructional faculty, and found many differences. In some cases, these results are easy to summarize. In faculty outcomes, for example, Asian/Pacific Islander faculty generally had higher salaries and were more likely to have tenure and be full professors than white, black, or Hispanic faculty; and white faculty were also more likely to experience these higher status outcomes than blacks, although Hispanic faculty did not differ significantly from either whites or blacks on these outcomes.[19] In general, white and Asian faculty had more experience than black faculty, and there was some evidence that whites and Asians were also more experienced than their Hispanic counterparts.

For other areas, the racial/ethnic differences are more complex. In terms of responsibilities, there was some evidence that the teaching load for Asian faculty was different from that of Hispanic faculty, while Asian faculty differed from black faculty in the types of research pursued and the time spent in such activities. Black faculty were less likely than white faculty to spend at least some time on research, and they had produced fewer recent research products overall. Asian and black faculty were more likely to have no administration time than white faculty; white and Hispanic faculty averaged more time on service activities than Asian respondents. In structural location, similarly, results were idiosyncratic. For example, white faculty were more likely than Asian or Hispanic faculty to be found in liberal arts colleges, while Hispanic faculty were more likely than white or Asian faculty to teach in 2-year colleges.

Observing the many specific racial/ethnic and gender differences in such areas as experience, responsibilities, and structural location, however, does not show whether these differences account for the racial/ethnic or gender differences in faculty outcomes. A multivariate model that controls for such inputs simultaneously is needed to determine the net differences by gender and race/ethnicity in outcomes. The next section looks at such a model.

[19] In general, the sample sizes for the various minority racial/ethnic groups were small, which can result in large standard errors and differences among groups that appear large but are not statistically significant.

Section 4: Multivariate Analysis

Sections 2 and 3 demonstrated that male and female faculty, as well as faculty of different racial/ethnic groups, differed both in faculty outcomes and in human capital and structural factors that may be associated with these outcomes. But if faculty of different demographic groups had similar human capital and other characteristics, would there still be variations in such faculty rewards as salary? To address this question, a series of multivariate regression analyses was conducted.

Since tenure and academic rank are themselves associated with salary, this section focuses on the base salary of faculty as the outcome of interest. Due to the skew in salary data, the log form of the variable was used as the dependent variable in the model. As in the bivariate analysis, the sample is restricted to full-time faculty with U.S. citizenship who indicated that their primary responsibility is teaching.

To examine whether gender and racial/ethnic differences in salary remain after controlling for human capital and structural attributes, a series of nested models were constructed. First, we estimated a regression of the relationship of gender and race/ethnicity together with the log of base salary to establish baseline differences for men and women (holding race/ethnicity constant) and by race/ethnicity (holding gender constant). Human capital variables were then entered into the regression. A third model included variables indicating some aspects of the social structure of the respondents, and a fourth model also added tenure and rank. In the second through fourth models, particular attention is paid to the relationship of gender and race/ethnicity to salary holding the other variables constant to determine whether differences exist between men and women, or for black, Hispanic, and Asian faculty compared to white faculty, when human capital, structural, and other faculty attributes (tenure and rank) are comparable.

Variable Selection and Creation

Many individual indicators of human capital and structural attributes were considered in sections 2 and 3; however, not all are available or applicable for all respondents, and others can be combined to create new variables capturing more information. Some studies that have examined multiple regression models of faculty salaries have experienced multicollinearity, particularly in terms of the indicators used to describe work experience, such as age, years of continuous employment, years working in academe, and years at current institution (Astin and Bayer 1972, 1979; Tuckman and Tuckman 1976). To estimate a parsimonious model, we chose time since attaining highest degree as an indicator of experience, since this indicator reflects the length of time spent at a given level of qualification while being applicable to a large number of respondents. Education level was assessed by comparing people who had received the doctoral or first-professional degree to all others.

To assess responsibilities, a ratio variable was created: the proportion of time spent teaching divided by the proportion of time spent in research. A positive relationship with salary for this variable would indicate that more time spent in teaching relative to time spent in research was associated with increases in salary, while a negative relationship would indicate the converse. In

terms of this new variable, male faculty spent less time teaching relative to the amount of time they spent in research than female faculty (not shown); Asians spent a smaller share of their time teaching relative to the share spent in research than white, non-Hispanic faculty, who in turn had a lower ratio than black faculty members. To assess research productivity, a combined variable indicating the number of works of various types[20] standardized by discipline and institution type was created.

Finally, following the work of Biglan (1973), the academic discipline in which each faculty member taught was characterized in terms of three dimensions: whether the field was "hard" or "soft," whether it was pure or applied, and whether it was a life systems field or not. For example, in Biglan's typology, a field such as engineering would be considered a "hard," applied field not having to do with life systems; English literature would be a "soft," pure field not related to life systems; and biological sciences would be a "hard," pure life systems field. Male faculty were less likely than female faculty to work in life systems fields, but they were more likely to be in "hard" fields and in pure fields. Black, non-Hispanic faculty were more likely than each of the other three groups to be found in life systems fields, while Asian/Pacific Islander faculty members were more likely than each of the other three groups to work in "hard" fields. Hispanic and white faculty were more likely than black faculty to work in pure fields as opposed to applied fields (not shown).

Results

The first model shown in table 26 reveals that, controlling for race/ethnicity, the salaries of female faculty are lower than those of male faculty. Asian/Pacific Islander faculty receive higher salaries than white, non-Hispanic faculty, when gender is held constant. Black faculty appear to earn less than white faculty when controlling for gender, but the evidence for this claim is not conclusive.[21] This result may reflect the greater proportion of female faculty among black faculty shown in table 1. The adjusted R-squared value for this model indicates that gender and race/ethnicity alone account for about 4.6 percent of the variance in base salaries of full-time instructional faculty whose primary responsibility is teaching.

The second model adds variables representing human capital characteristics, including training, job responsibilities, and research productivity, to the model. Time since receiving highest degree, having a doctoral or first-professional degree, and the indicator of research productivity are all positively associated with higher base salaries for this group of faculty, while teaching only undergraduate classes (compared to teaching both graduate and undergraduate students) and a larger proportion of time spent teaching relative to time spent in research were associated with lower salaries. Holding these additional variables constant, female faculty continue to earn less than male faculty, and Asian faculty continue to receive higher salaries than white faculty members. The addition of these characteristics to the model yields an adjusted R-squared of about 0.16, or 16 percent of the variance.

---

[20] The works included were refereed journal articles, book reviews, book chapters, books, and monographs. Bivariate analyses (not shown) indicate that male faculty published more combined works as reflected in this variable than women, although there were no significant racial/ethnic differences in this variable.

[21] This result is significant at the .10 level, rather than the conventional .05 level.

After adding structural characteristics to the model, however, there are no longer any significant racial/ethnic differences in base faculty salaries, holding gender, human capital characteristics, and structural location constant. Female faculty continue to earn less in base salary than male faculty. Relationships between human capital variables and salary are similar to the previous model. In addition, faculty in institutions located outside the South receive higher salaries compared to those in the South. Working in a life systems field or in a "hard" field are associated with a higher base salary, while working in a pure field is associated with a lower base salary. Faculty members located in research institutions receive higher base salaries, on average, than those in other types of institutions.

Adding controls for tenure and academic rank to the other characteristics does not change most of the relationships. In the final model, higher salaries are not only associated with more years of experience, holding a doctoral or first professional degree, research productivity, and working in a research university (compared to the omitted category of other unclassified institutions), but also with holding a tenured position and the rank of full, associate, or assistant professor (compared to other ranks). About 21 percent of the variance in base salaries of full-time faculty members is accounted for by the variables in the model. Racial/ethnic differences in base salaries are not significant, but female faculty members' salaries continue to be lower than male faculty, on average. Thus, when comparing faculty members with similar human capital characteristics, structural locations, and tenure and rank, female faculty earn less than male faculty. Under similar controls, faculty of different racial/ethnic groups receive similar salaries, despite the bivariate analysis demonstrating the many differences that exist among faculty of different racial/ethnic groups.

Section 5: Conclusion

Some questions remain unanswered by the analyses presented in this report. First, even when holding constant a myriad of variables that prior research has linked to salaries, female faculty members receive lower base salaries than male faculty members. This difference may be due to gender differences in still other variables that were not considered in this study, such as taking time out of the labor force for parenting responsibilities. Alternatively, this difference may be due to discrimination: differential returns in terms of salary for similar inputs across gender. Second, this study has shown differences in many of the variables that are associated with faculty outcomes across gender and race/ethnicity. Exploring the causes of these differences is beyond the scope of this report. As an example, the analyses presented here do not explain why Hispanic faculty are more likely to work at 2-year institutions than white or Asian faculty. It also does not explore the causes of the racial/ethnic and gender differences in highest degree received.

Third, though NSOPF:93 provides some evidence of the general status of women, Asian/Pacific Islanders, blacks, and Hispanics at colleges and universities nationwide, the survey does not permit detailed examinations of the status of faculty in these groups on individual campuses. Furthermore, the descriptive analyses in this study show that black faculty were concentrated in the southeastern United States, Hispanic faculty in the Southwest and far West, and Asian/Pacific Islander faculty in the far West. Because most of the nation's historically black colleges and universities (HBCUs) are located in the Southeast, it may be the case that black faculty are concentrated in HBCUs. Nonetheless, the sampling frame of the NSOPF:93 does not permit detailed examinations of black faculty working at HBCUs or comparisons between the experiences of faculty at HBCUs and their counterparts at non-HBCUs. Therefore, further research would be needed to more fully articulate the differences in experiences of faculty members in different regions and different types of institutions.

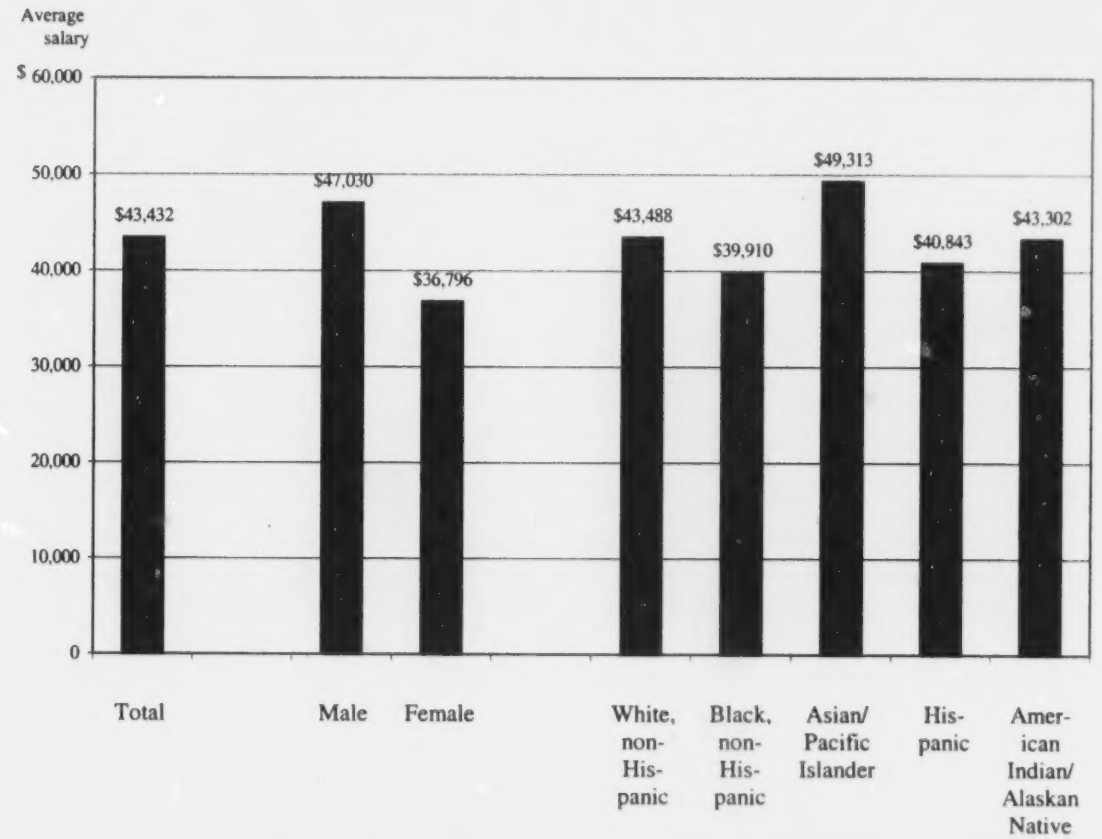
The bivariate analyses in this study reveal many differences in the characteristics and outcomes of full-time instructional faculty across race/ethnicity and gender. Asian/Pacific Islander faculty had higher base salaries and were more likely to have tenure and be full professors than each of the other three racial/ethnic groups compared; white faculty also received these rewards more often than black faculty members. White faculty, and to some extent Asian faculty, had more experience than black faculty members, and the research activities and productivity of these three groups also showed some differences. For example, black full-time faculty were less likely to hold doctorates and were less likely to be engaged in research than white faculty. The results for Hispanic faculty members were even more complex; for many variables considered in this report, Hispanic faculty were not significantly different from any of the other three racial/ethnic groups, and the ways in which Hispanic faculty members differed from white, black, and Asian faculty did not follow a consistent pattern. However, white faculty tended to be older, to have received their highest degrees less recently, and to have held their current jobs for more years than Hispanic faculty; white faculty were also less likely than Hispanic faculty to work in two-year colleges. When statistically controlling for a host of human capital and structural attributes, Hispanic, black, and Asian faculty members did not receive significantly different base salaries

than white faculty, despite bivariate results showing that many differences did exist among these groups in those background characteristics.[22]

Male and female faculty differed on most of the characteristics examined in this study. Men had higher salaries and were more likely to be tenured or full professors, and they had more experience than women on all indicators considered. Men spent less time teaching and were more likely to teach graduate classes. Further, male faculty spent more time in research and produced more recent works, and they spent more time in administration and were more likely to be department chairs than women. Female faculty were less often located at research universities, and more often at 2-year colleges, than male faculty, and the fields in which they worked varied as well. When these differences were taken into account, women still received lower average base salaries than men.

[22] This result differs from previous research with the NSOPF:93 data (Toutkoushian 1998). Among other differences between the papers, this report includes faculty at other ranks besides full, associate, or assistant professor, and includes faculty at 2-year institutions, while the other report focused on a more homogeneous group.

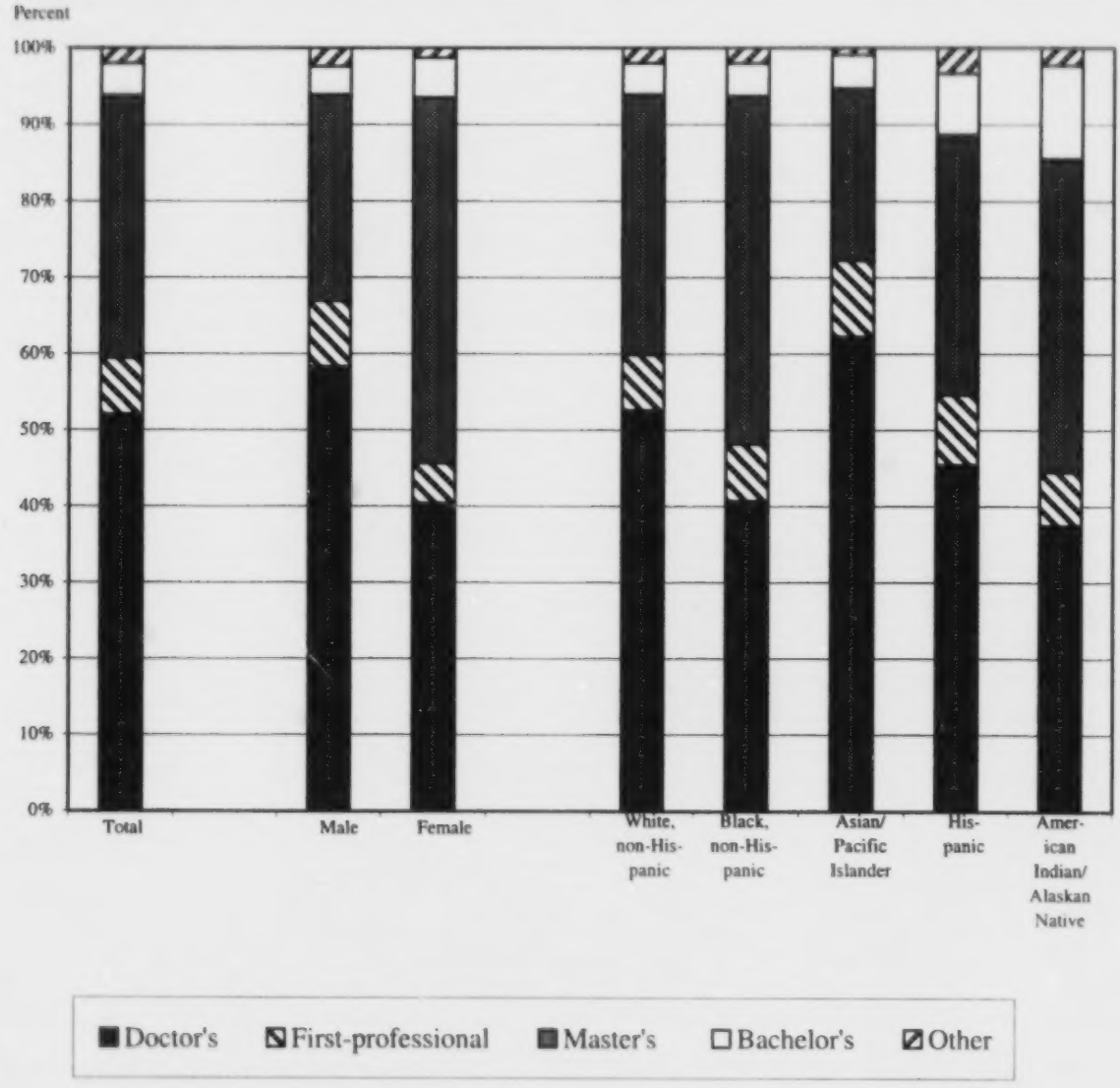
Figure 1.—Average base salary of full-time faculty whose primary responsibility is teaching, by gender and race/ethnicity: Fall 1992



NOTE: Includes U.S. citizens only. Also excluded are respondents with base salaries greater than $400,000.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Figure 2.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to highest degree attained, by gender and race/ethnicity: Fall 1992



NOTE: Includes U.S. citizens only.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 1.—Percentage distribution of faculty with U.S. citizenship whose primary responsibility is teaching according to gender, by race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Percentage of total*	Percentage of racial/ethnic subgroup	
			Male	Female
Total	**605**	**100.0**	**61.2**	**38.8**
Race/ethnicity				
White, non-Hispanic	539	89.1	61.4	38.6
Black, non-Hispanic	30	4.9	50.3	49.7
Asian/Pacific Islander	18	3.0	68.9	31.1
Hispanic	15	2.5	65.2	34.9
American Indian/Alaskan Native	3	0.5	65.2	34.8

* Percentages in column sum to 100.0.

NOTE: Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 2.—Percentage distribution of faculty with U.S. citizenship whose primary responsibility is teaching according to employment status, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Full-time	Part-time
Total	**605**	**59.8**	**40.2**
Gender			
Male	370	63.5	36.5
Female	235	54.1	45.9
Race/ethnicity			
White, non-Hispanic	539	59.6	40.4
Black, non-Hispanic	30	64.0	36.0
Asian/Pacific Islander	18	64.9	35.1
Hispanic	15	54.4	45.6
American Indian/Alaskan Native	3	56.8	43.2

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992—93 (NSOPF:93).

Table 3.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to base salary, and average base salary, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Less than $40,000	$40,000–49,999	$50,000–59,999	$60,000 or more	Average base salary
Total	**359**	**47.4**	**23.6**	**14.6**	**14.4**	**$43,432**
Gender						
Male	233	37.3	25.4	17.8	19.5	47,030
Female	126	66.0	20.4	8.7	4.9	36,796
Race/ethnicity						
White, non-Hispanic	318	47.4	23.7	14.5	14.4	43,488
Black, non-Hispanic	19	55.5	20.5	13.8	10.2	39,910
Asian/Pacific Islander	12	28.9	28.7	20.4	21.9	49,313
Hispanic	8	52.3	22.7	13.9	11.1	40,843
American Indian/ Alaskan Native	2	55.8	21.4	14.3	8.4	43,302

NOTE: Includes U.S. citizens only. Also excluded are respondents with base salaries greater than $400,000. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 4.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to tenure status, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Tenured	Tenure track	Not on tenure track	No tenure system
Total	**362**	**57.4**	**21.3**	**8.5**	**12.8**
Gender					
Male	235	65.9	17.8	6.2	10.1
Female	127	41.6	27.7	12.9	17.7
Race/ethnicity					
White, non-Hispanic	321	57.7	20.7	8.4	13.2
Black, non-Hispanic	19	48.0	30.2	11.7	10.1
Asian/Pacific Islander	12	68.6	16.9	7.2	7.4
Hispanic	8	51.0	32.0	8.5	8.5
American Indian/ Alaskan Native	2	52.6	16.6	11.1	19.7

NOTE: Includes U.S. citizens only. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 5.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to academic rank, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Full professor	Associate professor	Assistant professor	Instructor	Lecturer	Other/not applicable
Total	**362**	**30.9**	**23.9**	**22.9**	**15.9**	**2.0**	**4.5**
Gender							
Male	235	39.3	25.2	18.1	12.6	1.1	3.8
Female	127	15.3	21.5	31.8	21.9	3.8	5.7
Race/ethnicity							
White, non-Hispanic	321	31.3	24.0	22.9	15.2	2.0	4.6
Black, non-Hispanic	19	21.4	24.1	27.6	22.9	2.0	2.1
Asian/Pacific Islander	12	40.2	25.3	14.9	15.0	2.2	2.4
Hispanic	8	26.2	17.6	25.9	22.2	3.6	4.5
American Indian/ Alaskan Native	2	18.2	18.5	16.3	32.6	2.7	11.8

NOTE: Includes U.S. citizens only. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 6.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to highest degree attained, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Doctorate	First-professional	Master's	Bachelor's	Other
Total	**362**	**52.0**	**7.4**	**34.3**	**4.2**	**2.0**
Gender						
Male	235	58.4	8.6	27.0	3.7	2.4
Female	127	40.4	5.3	47.8	5.2	1.3
Race/ethnicity						
White, non-Hispanic	321	52.6	7.3	34.0	4.1	2.0
Black, non-Hispanic	19	40.7	7.5	45.5	4.3	2.0
Asian/Pacific Islander	12	62.3	10.0	22.4	4.4	0.9
Hispanic	8	45.4	9.2	34.0	8.0	3.3
American Indian/ Alaskan Native	2	37.5	7.0	41.0	12.2	2.3

NOTE: Includes U.S. citizens only. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 7.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to age, and average age, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Under 35	35 to 44	45 to 54	55 and above	Average age
Total	**362**	**7.2**	**26.9**	**37.7**	**28.3**	**48.7**
Gender						
Male	235	5.9	22.9	37.5	33.7	50.0
Female	127	9.4	34.2	38.1	18.2	46.3
Race/ethnicity						
White, non-Hispanic	321	6.9	26.6	38.1	28.4	48.8
Black, non-Hispanic	19	12.0	28.2	35.0	24.7	47.4
Asian/Pacific Islander	12	5.6	26.5	33.8	34.1	49.9
Hispanic	8	9.8	33.8	36.0	20.3	46.6
American Indian/ Alaskan Native	2	1.6	32.8	27.7	38.0	49.8

NOTE: Includes U.S. citizens only. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 8a.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to year received highest degree, and average number of years since receiving highest degree, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	1970 or earlier	1971–1980	1981 or later	Average years since receiving highest degree
Total	**360**	**28.4**	**33.4**	**38.2**	**15.5**
Gender					
Male	233	36.0	34.7	29.4	17.5
Female	127	14.6	30.9	54.4	11.8
Race/ethnicity					
White, non-Hispanic	319	29.4	32.8	37.8	15.7
Black, non-Hispanic	19	16.2	37.0	46.8	13.2
Asian/Pacific Islander	12	28.8	41.4	29.8	16.7
Hispanic	8	18.4	37.2	44.4	13.5
American Indian/ Alaskan Native	2	28.5	32.4	39.2	14.9

NOTE: Includes U.S. citizens only. Estimated population figures do not match other estimates for this population due to missing values on the column variable. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 8b.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to gender and race/ethnicity, by year received highest degree: Fall 1992

	Estimated number in population (1,000s)	Total	1970 or earlier	1971–1980	1981 or later
Total	**360**	**100.0**	**100.0**	**100.0**	**100.0**
Gender					
Male	233	64.8	81.9	67.4	49.8
Female	127	35.2	18.1	32.6	50.2
Race/ethnicity					
White, non-Hispanic	319	88.7	91.8	87.1	87.9
Black, non-Hispanic	19	5.2	3.0	5.8	6.4
Asian/Pacific Islander	12	3.3	3.3	4.0	2.5
Hispanic	8	2.3	1.5	2.5	2.6
American Indian/ Alaskan Native	2	0.5	0.5	0.5	0.5

NOTE: Includes U.S. citizens only. Estimated population figures and total percentages do not match other estimates for this population due to missing values on the column variable. Percentages for subgroups sum to 100 within columns. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992—93 (NSOPF:93).

Table 9.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to length of time in current job, and average length of time in current job, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	0–5 years	6–10 years	11–15 years	16 or more years	Average years in current job
Total	**362**	**34.3**	**16.8**	**14.3**	**34.6**	**12.2**
Gender						
Male	235	28.6	15.2	14.8	41.4	13.8
Female	127	44.8	19.7	13,4	22.1	9.3
Race/ethnicity						
White, non-Hispanic	321	33.7	16.8	14.3	35.2	12.4
Black, non-Hispanic	19	41.4	18.3	12.4	27.8	10.3
Asian/Pacific Islander	12	33.2	14.0	17.7	35.0	12.4
Hispanic	8	39.8	19.2	15.6	25.3	10.4
American Indian/ Alaskan Native	2	42.0	15.6	7.2	35.1	11.0

NOTE: Refers to current position at current institution. Includes U.S. citizens only. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 10.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to years in current rank, and average years in current rank, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	0–5 years	6–10 years	11–15 years	16 or more years	Average years in current rank
Total	**349**	**48.6**	**20.8**	**13.9**	**16.8**	**8.3**
Gender						
Male	228	42.0	20.8	16.0	21.2	9.4
Female	121	61.0	20.6	9.9	8.5	6.2
Race/ethnicity						
White, non-Hispanic	309	48.1	20.9	13.8	17.2	8.4
Black, non-Hispanic	19	56.2	20.1	11.6	12.2	7.2
Asian/Pacific Islander	12	43.4	19.3	20.4	16.9	9.0
Hispanic	8	55.6	17.7	13.9	12.8	7.4
American Indian/ Alaskan Native	2	50.8	20.4	10.8	17.9	8.2

NOTE: Includes U.S. citizens only. Estimated population figures are smaller than those for other tables for the same population due to missing values on the column variable. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 11.—Percentage distribution of tenured full-time faculty whose primary responsibility is teaching according to years with tenure, and average years with tenure, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	0–5 years	6–10 years	11–15 years	16 or more years	Average years with tenure
Total	**208**	**23.4**	**19.4**	**17.8**	**39.4**	**13.0**
Gender						
Male	155	20.0	17.6	17.9	44.5	14.0
Female	53	33.5	24.7	17.5	24.3	10.0
Race/ethnicity						
White, non-Hispanic	185	23.0	19.0	17.6	40.4	13.1
Black, non-Hispanic	9	26.1	25.0	17.4	31.5	11.4
Asian/Pacific Islander	8	27.0	20.1	21.5	31.4	11.9
Hispanic	4	24.2	26.4	19.2	30.2	11.6
American Indian/ Alaskan Native	1	44.0	10.1	16.5	29.4	9.8

NOTE: Includes U.S. citizens only. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 12.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to percentage of time spent on teaching activities,* and average percentage, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Less than 50%	50 to 74%	75% or more	Average percentage of time
Total	**362**	**21.3**	**36.9**	**41.8**	**65.0**
Gender					
Male	235	24.4	38.8	36.8	62.6
Female	127	15.6	33.4	51.0	69.3
Race/ethnicity					
White, non-Hispanic	321	21.3	36.8	41.9	65.1
Black, non-Hispanic	19	20.2	37.6	42.2	64.0
Asian/Pacific Islander	12	23.3	37.9	38.8	63.3
Hispanic	8	24.1	35.2	40.7	63.7
American Indian/ Alaskan Native	2	12.0	36.3	51.7	70.1

* In addition to classroom time, teaching activities include such tasks as grading, course preparation, and advising students.

NOTE: Includes U.S. citizens only. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 13.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to level of instruction, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Undergraduate only	Both graduate and undergraduate	Graduate only
Total	**352**	**75.2**	**13.9**	**10.9**
Gender				
Male	229	72.2	15.9	11.9
Female	123	80.7	10.2	9.1
Race/ethnicity				
White, non-Hispanic	313	75.1	14.0	10.9
Black, non-Hispanic	18	78.8	10.4	10.7
Asian/Pacific Islander	11	67.7	17.3	14.9
Hispanic	8	80.6	13.0	6.4
American Indian/Alaskan Native	2	82.6	16.5	0.9

NOTE: Includes U.S. citizens only. Estimated population figures are smaller in this table than in other tables for this population due to missing values on the column variable. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 14.—Among full-time faculty whose primary responsibility is teaching, average student contact hours per week and classroom hours per week, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Average student contact hours per week*	Average classroom hours per week
Total	**352**	**375.4**	**10.1**
Gender			
Male	229	380.5	10.0
Female	123	365.8	10.3
Race/ethnicity			
White, non-Hispanic	313	371.9	10.1
Black, non-Hispanic	18	425.1	10.3
Asian/Pacific Islander	11	401.1	9.7
Hispanic	8	367.3	11.3
American Indian/Alaskan Native	2	347.1	13.2

* Number of hours per week spent teaching for-credit classes by the number of students in those classes.

NOTE: Student contact hours and classroom hours refer to credit classes only. Includes U.S. citizens only. Estimated population figures are smaller in this table than in other tables for this population due to missing values on the column variable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 15.—Percentage of full-time faculty whose primary responsibility is teaching who were pursuing research or other scholarly activity, and of those, percentage in funded research, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Percent in research or other scholarly activity	Of those, percent in funded research
Total	**362**	**64.0**	**30.8**
Gender			
Male	235	67.4	32.6
Female	127	57.9	27.1
Race/ethnicity			
White, non-Hispanic	321	64.4	30.0
Black, non-Hispanic	19	51.1	35.8
Asian/Pacific Islander	12	78.0	42.7
Hispanic	8	59.5	36.9
American Indian/Alaskan Native	2	61.1	25.0

NOTE: Includes U.S. citizens only.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 16.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to percentage of time spent on research, and average percentage, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	No time spent on research	1–10%	More than 10%	Average percentage of time on research
Total	**362**	**27.2**	**35.5**	**37.3**	**13.2**
Gender					
Male	235	24.8	32.5	42.7	14.9
Female	127	31.6	41.1	27.3	9.9
Race/ethnicity					
White, non-Hispanic	321	26.9	36.0	37.2	13.1
Black, non-Hispanic	19	34.0	34.2	31.8	11.3
Asian/Pacific Islander	12	20.6	29.8	49.6	17.8
Hispanic	8	29.7	29.0	41.4	14.3
American Indian/Alaskan Native	2	39.8	38.3	21.9	7.2

NOTE: Includes U.S. citizens only. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 17.—Among full-time faculty whose primary responsibility is teaching and who were pursuing research or other scholarly activity, percentage distribution according to primary type of research activity, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Pure/ basic research	Applied research	Policy research	Literary work	Program design/ develop-ment	Other
Total	**232**	**28.5**	**28.1**	**6.3**	**15.1**	**14.1**	**7.9**
Gender							
Male	158	31.7	29.4	6.4	14.0	11.3	7.2
Female	74	21.6	25.2	6.0	17.4	20.2	9.6
Race/ethnicity							
White, non-Hispanic	206	28.5	28.0	6.3	15.2	14.2	7.8
Black, non-Hispanic	10	23.7	22.6	9.7	16.6	16.1	11.3
Asian/Pacific Islander	9	34.1	37.7	3.7	8.0	10.5	6.0
Hispanic	5	30.7	24.3	7.0	19.8	11.6	6.5
American Indian/ Alaskan Native	1	14.6	26.0	4.3	28.7	13.0	13.3

NOTE: Includes U.S. citizens only. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 18a.—Among full-time faculty whose primary responsibility is teaching, standardized numbers of various types of scholarly works over the previous two years, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Articles in refereed journals	Articles in non-refereed journals	Creative works in juried media	Creative works in non-juried media	Presentations	Exhibitions in fine arts	Patents or copyrights
Total	**361**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**
Gender								
Male	234	1.12	1.13	1.09	1.10	0.99	1.10	1.10
Female	127	0.77	0.74	0.85	0.81	1.02	0.83	0.82
Race/ethnicity								
White, non-Hispanic	320	1.00	1.01	0.94	0.98	1.01	1.01	1.04
Black, non-Hispanic	19	0.80	0.56	1.66	1.36	0.90	1.35	0.71
Asian/Pacific Islander	12	1.52	1.33	0.70	0.46	0.95	0.30	0.61
Hispanic	8	0.80	1.11	1.61	1.91	0.95	0.66	0.82
American Indian/ Alaskan Native	2	0.66	1.28	4.23	0.98	0.94	3.26	1.05

NOTE: Includes U.S. citizens only. Estimated population figures are smaller in this table than in other tables for this population due to missing values on the column variables. Numbers of scholarly works are standardized by academic discipline (calculated by dividing the number of articles in refereed journals for that faculty member by the mean number of articles for all faculty teaching in the same academic discipline). Unstandardized numbers for full-time faculty by field are shown in appendix table C1.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 18b.—Among full-time faculty whose primary responsibility is teaching, standardized numbers of various scholarly writings in the previous two years, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Books	Monographs	Technical reports	Book reviews	Book chapters	Textbooks	Computer software
Total	**361**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**
Gender								
Male	234	1.10	1.16	1.05	1.11	1.04	1.15	1.18
Female	127	0.81	0.71	0.90	0.79	0.92	0.72	0.67
Race/ethnicity								
White, non-Hispanic	320	1.02	0.93	1.00	1.00	1.00	1.02	1.03
Black, non-Hispanic	19	0.74	1.78	0.88	0.89	0.80	0.48	0.39
Asian/Pacific Islander	12	0.54	1.15	1.24	0.82	0.99	1.35	0.39
Hispanic	8	1.70	1.88	1.16	1.41	1.20	0.69	2.46
American Indian/ Alaskan Native	2	0.31	0.46	0.52	0.89	0.84	2.06	0.26

NOTE: Includes U.S. citizens only. Estimated population figures are smaller in this table than in other tables for this population due to missing values on the column variables. Numbers of scholarly works are standardized by academic discipline (calculated by dividing the number of articles in refereed journals for that faculty member by the mean number of articles for all faculty teaching in the same academic discipline). Unstandardized numbers for full-time faculty by field are shown in appendix table C1.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 19.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to percentage of time spent on administration, and average percentage, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	No time spent on adminis-tration	1–10%	More than 10%	Average percentage of time on administration*
Total	**362**	**44.4**	**32.6**	**23.0**	**8.4**
Gender					
Male	235	41.7	34.3	24.0	8.8
Female	127	49.5	29.4	21.0	7.6
Race/ethnicity					
White, non-Hispanic	321	43.7	33.1	23.2	8.5
Black, non-Hispanic	19	50.0	27.2	22.9	8.4
Asian/Pacific Islander	12	52.9	28.7	18.4	6.9
Hispanic	8	49.7	31.7	18.6	6.7
American Indian/Alaskan Native	2	44.4	32.9	28.4	9.5

* Includes those who said they spent no time on administration.

NOTE: Includes U.S. citizens only. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 20.—Percentage of full-time faculty whose primary responsibility is teaching who chaired their departments, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Percent chairing department
Total	**362**	**13.1**
Gender		
Male	235	14.0
Female	127	11.5
Race/ethnicity		
White, non-Hispanic	321	13.1
Black, non-Hispanic	19	12.9
Asian/Pacific Islander	12	12.3
Hispanic	8	13.8
American Indian/Alaskan Native	2	20.7

NOTE: Includes U.S. citizens only.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 21.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to percentage of time spent on service, and average percentage, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	No time spent on service	1–10%	More than 10%	Average percentage of time on service *
Total	**362**	**44.8**	**42.5**	**12.7**	**5.6**
Gender					
Male	235	46.8	40.3	12.9	5.5
Female	127	41.0	46.5	12.4	5.7
Race/ethnicity					
White, non-Hispanic	321	44.8	42.6	12.6	5.5
Black, non-Hispanic	19	42.6	40.9	16.5	6.8
Asian/Pacific Islander	12	52.9	37.8	9.3	4.4
Hispanic	8	41.6	45.0	13.4	6.4
American Indian/Alaskan Native	2	33.9	59.2	7.0	5.7

* Includes those who said they spent no time on service activities.

NOTE: Includes U.S. citizens only. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 22.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to institution type, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Research university	Doctoral university	Comprehensive college	Liberal arts college	2-year college	Other
Total	**362**	**18.1**	**11.0**	**29.5**	**9.0**	**26.5**	**5.9**
Gender							
Male	235	20.4	11.8	29.8	8.4	22.8	6.7
Female	127	13.9	9.4	28.9	10.0	33.4	4.3
Race/ethnicity							
White, non-Hispanic	321	18.3	11.2	29.2	9.4	26.0	5.9
Black, non-Hispanic	19	13.4	7.3	39.5	7.0	28.8	4.0
Asian/Pacific Islander	12	25.7	11.2	25.8	5.0	22.1	10.2
Hispanic	8	14.0	8.9	26.0	4.9	42.1	4.2
American Indian/ Alaskan Native	2	8.2	12.9	15.7	9.5	53.7	0

NOTE: Includes U.S. citizens only. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 23.—Percentage distribution of full-time faculty whose primary responsibility is teaching according to gender, by teaching field: Fall 1992

	Estimated number in population (1,000s)	Male	Female
Total	**361**	**64.9**	**35.1**
Teaching field			
Business	31	66.4	33.6
Education	27	49.8	50.2
Engineering	15	93.9	6.1
Fine Arts	27	67.0	33.0
Nursing	18	1.5	98.5
Other health	23	60.2	39.8
English and foreign languages	41	48.2	51.8
History and philosophy	19	79.0	21.0
Law	7	66.4	33.6
Biological sciences	18	72.5	27.5
Physical sciences	19	86.7	13.3
Math and computer science	29	73.4	26.6
Social science	42	73.6	26.4
Occupational programs	13	83.6	16.4
Other	33	67.9	32.1

NOTE: Estimated population figures and total percentages do not match other estimates for this population due to missing values. Includes U.S. citizens only. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 24.—Among full-time faculty whose primary responsibility is teaching, percentage distribution according to teaching field, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Business	Education	Engineering	Fine arts	Nursing	Other health	English and foreign languages
Total	**361**	**8.7**	**7.5**	**4.3**	**7.4**	**4.9**	**6.4**	**11.3**
Gender								
Male	234	8.9	5.8	6.2	7.7	0.1	5.9	8.4
Female	127	8.3	10.7	0.7	7.0	13.9	7.2	16.6
Race/ethnicity								
White, non-Hispanic	320	9.0	7.4	3.9	7.5	4.9	6.2	11.2
Black, non-Hispanic	19	6.3	11.6	2.7	8.7	7.5	8.3	8.4
Asian/Pacific Islander	12	4.9	3.1	16.4	4.8	4.0	9.5	8.6
Hispanic	8	6.1	8.3	5.7	6.5	1.9	3.8	21.2
American Indian/ Alaskan Native	2	14.8	17.3	6.1	8.7	2.2	4.0	13.8

Table 24.—Among full-time faculty whose primary responsibility is teaching, percentage distribution according to teaching field, by gender and race/ethnicity: Fall 1992—Continued

	History and philosophy	Law	Biological sciences	Physical sciences	Math and computer science	Social science	Occupational programs	Other
Total	**5.2**	**1.9**	**5.1**	**5.2**	**8.0**	**11.5**	**3.6**	**9.0**
Gender								
Male	6.3	2.0	5.6	7.0	9.1	13.1	4.6	9.4
Female	3.1	1.8	4.0	2.0	6.1	8.7	1.7	8.2
Race/ethnicity								
White, non-Hispanic	5.4	1.9	5.0	5.3	8.0	11.5	3.7	9.2
Black, non-Hispanic	3.8	2.7	4.6	3.2	6.1	13.4	3.0	9.7
Asian/Pacific Islander	2.1	1.2	7.3	8.4	14.1	8.0	1.8	5.8
Hispanic	3.0	2.2	4.7	4.6	6.2	12.6	4.4	8.8
American Indian/ Alaskan Native	2.2	0	2.9	8.4	10.0	11.8	5.5	0.5

NOTE: Includes U.S. citizens only.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 25.—Among full-time faculty whose primary responsibility is teaching, percentage distribution according to geographical region, by race/ethnicity: Fall 1992

	Total	White, non-Hispanic	Black, non-Hispanic	Asian/ Pacific Islander	Hispanic	American Indian/ Alaskan Native
Estimated number in population (1,000s)	362	321	19	12	8	2
Percentage in region						
Northeast	21.6	22.1	16.5	21.2	15.0	13.1
New England	6.2	6.6	2.2	5.5	3.7	3.5
Mid-Atlantic	15.1	15.2	14.3	15.4	11.3	9.5
U.S. Service Schools	0.3	0.3	0.0	0.3	0.0	0.0
Midwest	27.3	28.4	18.8	23.3	10.1	32.2
Great Lakes	17.4	17.7	16.8	17.7	5.1	20.0
Plains	10.0	10.7	1.9	5.6	5.0	12.3
South	34.4	33.1	56.0	28.3	43.5	34.7
Southeast	25.0	24.1	47.4	18.9	18.9	15.5
Southwest	9.4	9.0	8.5	9.4	24.6	19.1
West	16.7	16.4	8.8	27.3	31.4	20.0
Rocky Mountains	3.3	3.6	0.4	0.5	4.1	0.3
Far West	13.4	12.8	8.4	26.8	27.2	19.8

NOTE: Includes U.S. citizens only. Percentages in columns sum to 100. Detail may not sum to totals due to rounding.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table 26.—Among full-time faculty whose primary responsibility is teaching, regression coefficients for multivariate models of factors associated with base salary: Fall 1992

	Model 1	Model 2	Model 3	Model 4
Intercept	10.88	-13.06	-12.37	0.40
Female (compared to male)	-0.24 *	-0.10 *	-0.11 *	-0.08 *
Race/ethnicity (compared to white, non-Hispanic)				
Black, non-Hispanic	-0.07	-0.03	-0.01	-0.01
Asian/Pacific Islander	0.12 *	0.07 *	0.04	0.03
Hispanic	-0.02	0.02	0.02	0.02
American Indian/Alaskan Native	-0.04	0.03	0.02	0.05
Years since highest degree attained (in 10s)		0.12 *	0.12 *	0.05 *
Doctorate or first-professional degree (compared to other)		0.21 *	0.22 *	0.14 *
Level of instruction (compared to both undergraduate and graduate)				
Undergraduate only		-0.14 *	-0.10 *	-0.10 *
Graduate only		0.02	-0.02	-0.01
Percent time teaching/ percent time research[1]		-0.07 *	-0.07 *	-0.05 *
Scholarly works[2]		0.10*	0.10 *	0.08 *
Region (compared to South)				
Northeast			0.12 *	0.10 *
Midwest			0.04 *	0.03
West			0.13 *	0.10 *
Institution type (compared to other)				
Research			0.14 *	0.11 *
Doctoral			0.04	0.01
Comprehensive			0.01	-0.03
Liberal arts			-0.04	-0.08
Two-year			0.06	0.02

Table 26.—Among full-time faculty whose primary responsibility is teaching, regression coefficients for multivariate models of factors associated with base salary: Fall 1992—Continued

	Model 1	Model 2	Model 3	Model 4
Life systems field (compared to non-life systems field)[3]			0.02 *	0.02
"Hard" field (compared to "soft" field)[3]			0.03 *	0.03 *
Pure field (compared to applied field)[3]			-0.09 *	-0.08 *
Tenured (compared to non-tenured)				0.15 *
Academic rank (compared to other)				
Full professor				0.21 *
Associate professor				0.07 *
Assistant professor				0.07 *
Adjusted R^2	0.046	0.157	0.180	0.215

* $p < .05$.

[1] Ratio of percentage of time spent on teaching to percentage of time spent on research, divided by 100.

[2] Number of refereed journal articles, book reviews, book chapters, books, and monographs published in the last 2 years, standardized by academic discipline and institution type, divided by 100.

[3] Classification of academic discipline based on dimensions defined by Biglan (1973). Life systems fields are Agriculture/home economics; Teacher education and Other education; First-professional health, Other health, and Nursing; Biological sciences; Sociology; Political science; and Other social science. "Hard" fields are Agriculture/home economics, Engineering, Biological sciences, Physical sciences, Mathematics, Computer sciences, and Psychology. Pure fields are English literature, Foreign languages, History, Philosophy, Biological sciences, Physical sciences, Mathematics, Political science, Sociology, and Other social science.

NOTE: Dependent variable is logged. Includes U.S. citizens only. See appendix A for a discussion of regression and interpretation of regression coefficients.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

References

Astin, H.S., Bayer, A.E. 1972. "Sex Discrimination in Academe." *Educational Record* 53: 101–118.

Astin, H.S., Bayer, A.E. 1979. "Pervasive Sex Differences in the Academic Reward System." Chapter 10 in D.R. Lewis and J.W.E. Becker, Eds., *Academic Rewards in Higher Education*. Cambridge: Balinger Publishing Company.

Barbezat, D. 1988. "Gender Differences in the Academic Reward System." Chapter 7 in D.W. Breneman and T.I. Youn, Eds., *Academic Labor Markets and Careers*. New York: The Falmer Press, 138–164.

Bellas, M.L. 1993. "Faculty Salaries: Still a Cost of Being a Female?" *Social Science Quarterly* 74(1): 62–75.

Bellas, M.L. 1994. "Comparable Worth in Academia: The Effects on Faculty Salaries of the Sex Composition and Labor Market Conditions of Academic Disciplines." *American Sociological Review* 59: 807–821.

Biglan, A. 1973. "The Characteristics of Subject Matter in Different Academic Areas." *Journal of Applied Psychology* 57 (3): 195–203.

Braskamp, L.A., Muffo, J.A., Langston, I.W. 1978. "Determining Salary Equity." *Journal of Higher Education* 49(3): 231–246.

Broder, I.E. 1993. "Professional Achievements and Gender Differences Among Academic Economists." *Economic Inquiry* 31: 116–127.

Cox, M. and Astin, A.W. 1977. "Sex Differentials in Faculty Salaries. Research in Higher Education," 289–298.

England, P. 1992. *Comparable Worth: Theories and Evidence*. New York: Aldine De Gruyter.

Fairweather, J.S. 1993. "Academic Values and Faculty Rewards." *The Review of Higher Education* 17(1): 43–68.

Fairweather, J.S. 1995. "Myths and Realities of Academic Labor Markets." *Economics of Education Review* 14(2): 179–192.

Fairweather, J.S. 1996. *Faculty Work and Public Trust: Restoring the Value of Teaching and Public Service in American Academic Life*. Boston: Allyn and Bacon.

Ferber, M.A., Green, C.A. 1982. "Traditional or Reverse Sex Discrimination? A Case Study of a Large Public University." *Industrial and Labor Relations Review* 35(4): 550–564.

Ferber, M.A., Kordick, B. 1978. "Sex Differentials in the Earnings of Ph.D.s." *Industrial and Labor Relations Review* 31(2): 227–238.

Ferber, M.A., Loeb, J.W., Lowry, H.M. 1978. "The Economic Status of Women Faculty: A Reappraisal." *The Journal of Human Resources* 13(3): 385–401.

Formby, J.P., Gunther, W.D., Sakano, R. 1993. "Entry Level Salaries of Academic Economists: Does Gender or Age Matter?" *Economic Inquiry* 31: 128–138.

Gomez-Mejia, L.R., Balkin, D.B. 1992. "Determinants of Faculty Pay: An Agency Theory Perspective." *Academy of Management Journal* 35(5): 921–955.

Gordon, N.M., Morton, T.E., Braden, I.C. 1974. "Faculty Salaries: Is There Discrimination by Sex, Race, and Discipline?" *The American Economic Review* 64(3): 419–427.

Gregorio, D.I., Lewis, L.S., Wannter, R.A. 1982. "Assessing Merit and Need: Distributive Justice and Salary Attainment in Academia." *Social Science Quarterly* 63,(3): 492–505.

Hirsch, B.T., Leppel, K. 1982. "Sex Discrimination in Faculty Salaries: Evidence from a Historically Women's University." *The American Economic Review* 72(4):829–835.

Hoffman, E.P. 1976. "Faculty Salaries: Is There Discrimination by Sex, Race, and Discipline? Additional Evidence." *The American Economic Review* 66(1): 196–198.

Johnson, G.E., Stafford, F.P. 1974. "The Earnings and Promotion of Women Faculty." *The American Economic Review* 64(6): 888–903.

Jusenius, C.L., Scheffler, R.M. 1981. "Earnings Differentials among Academic Economists: Empirical Evidence on Race and Sex." *Journal of Economics and Business* 33(2): 88–96.

Katz, D.A. 1973. "Faculty Salaries, Promotions, and Productivity at a Large University." *The American Economic Review* 63(3): 469–477.

Kelly, R.M., Bayes, J. 1988. "Comparable Worth and Pay Equity: Issues and Trends." In R.M. Kelley and J. Bayes, Eds., *Comparable Worth, Pay, Equity, and Public Policy*. New York: Greenwood Press Inc.

Langston, N., Pfeffer, J. 1994. "Paying the Professor: Sources of Salary Variation in Academic Labor Markets." *American Sociological Review* 59: 236–256.

Lewis, D.R., Becker, J.W.E., Eds. 1979. *Academic Rewards in Higher Education*. Cambridge: Balinger Publishing Company.

Loeb, J.W., Ferber, M.A., Lowry, H.M. 1978. "The Effectiveness of Affirmative Action for Women." *Journal of Higher Education* 49(3): 218–230.

Moore, K.M., Amey, M.J. 1993. *Making Sense of the Dollars: The Costs and Uses of Faculty Compensation* (ASHE-ERIC Higher Education Report 5). Washington D.C.: The George Washington University, School of Education and Human Development.

Nakanishi, D.T. 1993. "Asian Pacific Americans in Higher Education: Faculty and Administrative Representation and Tenure." *New Directions for Teaching and Learning* 53: 51–59.

Raymond, R.D., Sesnowitz, M.L., Williams, D.R. 1988. "Does Sex Still Matter? New Evidence from the 1980's." *Economic Inquiry*: 26: 43–58.

Selfa, L. A., Suter, N., Myers, S., Koch, S., Johnson, R.A., Zahs, D.A., Kuhr, B.D., Abraham, S.Y. 1997. *1993 National Study of Postsecondary Faculty (NSOPF-93):Methodology Report* (NCES 97-467). Washington, DC: U.S. Department of Education, National Center for Education Statistics.

Smart, J.C. 1991. "Gender Equity in Academic Rank and Salary." *The Review of Higher Education* 14(4): 511–526.

Tolbert, P.S. 1986. "Organizations and Inequality: Sources of Earnings Differences between Male and Female Faculty." *Sociology of Education* 59: 227–235.

Toutkoushian, R.K. 1998. "Racial and Marital Status Differences in Faculty Pay." *Journal of Higher Education* 69(5): 513–541.

Toutkoushian, R.K. Forthcoming. "The Status of Academic Women in the 1990s: No Longer Outsiders, But Not Yet Equals." *Quarterly Review of Economics and Finance* 39.

Tuckman, H.P. 1979. "The Academic Reward Structure in American Higher Education." Chapter 9 in D.R. Lewis and W.E. Becker, Eds., *Academic Rewards in Higher Education*. Cambridge: Ballinger Publishing Company: 165–190.

Tuckman, H.P., and Hagemann, R.P. 1976. "An Analysis of the Reward Structure in Two Disciplines." *Journal of Higher Education* 47(4): 447–464.

Tuckman, B.H., Tuckman, H.P. 1976. "The Structure of Salaries at American Universities." *Journal of Higher Education* 17(1): 51–64.

U.S. Bureau of the Census. 1998. *United States Population Estimates, by Age, Sex, Race, and Hispanic Origin, 1990 to 1997*. Release PPL-91. Washington, DC: Population Division, U.S. Bureau of the Census.

U. S. Bureau of the Census. 1996. *Population Projections for States by Age, Sex, Race, and Hispanic Origin: 1995 to 2025*. Release PPL-47, by Paul R. Campbell. Washington, DC: Population Division, U.S. Bureau of the Census.

Weiler, W.C. 1990. "Integrating Rank Differences into a Model of Male-Female Faculty Salary Discrimination." *Quarterly Review of Economics and Business* 30(1): 3–15.

Youn, T.I.K. 1988. "Studies of Academic Markets and Careers: A Historical Review." Chapter 1 D.W. Breneman and T.I.K. Youn, Eds., *Academic Labor Markets and Careers*. New York: The Falmer Press: 8–27.

Appendix A:

Technical Notes

Technical Notes

Overview

The 1992–93 National Study of Postsecondary Faculty (NSOPF:93) was sponsored by the U.S. Department of Education's National Center for Education Statistics (NCES). The study received additional support from the National Science Foundation (NSF) and the National Endowment for the Humanities (NEH). It was conducted by the National Opinion Research Center (NORC) at the University of Chicago under contract to NCES.

The first cycle of NSOPF was conducted in 1987–88 (NSOPF:88) with a sample of 480 institutions (including 2-year, 4-year, doctorate-granting, and other colleges and universities), over 3,000 department chairpersons, and over 11,000 faculty. The second cycle of NSOPF, conducted in 1992–93, was limited to surveys of institutions and faculty, but with a substantially expanded sample of 974 public and private nonproprietary higher education institutions and 31,354 faculty. The study was designed to provide a national profile of faculty: their professional backgrounds, responsibilities, workloads, salaries, benefits, and attitudes.

Institution Universe

The definition of the institution universe for NSOPF:93 was identical to the one used in NSOPF:88. It included institutions in the traditional sector of higher education: that is, institutions whose accreditation at the college level is recognized by the U.S. Department of Education, that provide formal instructional programs of at least two years' duration, that are public or private not-for-profit, and that are designed primarily for students who have completed the requirements for a high school diploma or its equivalent.

Faculty Universe

Unlike NSOPF:88, which was limited to faculty whose regular assignment included instruction, the faculty universe for NSOPF:93 was expanded to include all those who were designated as faculty, whether or not their responsibilities included instruction, and other (non-faculty) personnel with instructional responsibilities. Under this definition, researchers and administrators and other institutional staff who hold faculty positions, but who do not teach, were included in the sample. Instructional staff without faculty status also were included. In summary, the eligible universe was defined to include:

- full- and part-time personnel whose regular assignment included instruction;
- full- and part-time individuals with faculty status whose regular assignment did not include instruction;
- permanent and temporary personnel with any instructional duties, including adjunct, acting, or visiting status; and

- faculty and instructional personnel on sabbatical leave.

Excluded from the NSOPF:93 universe of faculty were:

- faculty and other personnel with instructional duties outside the United States (but not on sabbatical leave);
- temporary replacements for faculty and other instructional personnel;
- faculty and other instructional and non-instructional personnel on leave without pay;
- graduate teaching assistants;
- military personnel who taught only ROTC courses; and
- instructional personnel supplied by independent contractors.

Sample Design

A two-stage stratified, clustered probability design was used to select the NSOPF:93 sample. The first-stage NSOPF:93 sampling frame consisted of the 3,256 postsecondary institutions that provided formal instructional programs of at least two years' duration and that were public or private, not-for-profit, drawn from the 1991–92 IPEDS (Integrated Postsecondary Education Data System[1]) Institutional Characteristics Survey. The sampling frame was sorted by type and control of institution to create groups of institutions called strata. The selection of institutions occurred independently within each stratum.

A modified Carnegie[2] classification system was used to stratify institutions according to cross-classification of control by type, first into 17 cells, and then into 15 strata. There were two levels of control, public and private, and nine types of institutions including:

1. Research universities (public or private): These institutions offer a full range of baccalaureate programs, are committed to graduate education through the doctorate, and give high priority

[1] IPEDS is a recurring set of surveys developed and maintained by NCES. Postsecondary education is defined by IPEDS as "the provision of a formal instructional program whose curriculum is designed primarily for students who have completed the requirements for a high school diploma or its equivalent." This definition includes programs whose purpose is academic, vocational and continuing professional education and excludes avocational and adult basic education. IPEDS encompasses all institutional providers of postsecondary education in the United States and its outlying areas. For more information on IPEDS data used in this study, see National Center for Education Statistics, *IPEDS Manual for Users* (Washington, DC: National Center for Education Statistics 1991). This manual is also distributed with IPEDS data on CD-ROM.

[2] See *A Classification of Institutions of Higher Education*, (Princeton, N.J.: The Carnegie Foundation for the Advancement of Teaching), 1987. Out of the 3,256 institutions, 278 could not be classified. Carnegie staff supplied updates for 81 institutions; the remaining group of unclassified institutions were designated as "unknown" on the NSOPF:93 sampling frame.

to research. They award 50 or more doctoral degrees each year. There were 104 research institutions in the NSOPF:93 sampling frame;

2. Other Ph.D. (public or private): These institutions offer a full range of baccalaureate programs and are committed to graduate education through the doctorate. They award annually at least 10 doctoral degrees (in three or more disciplines), or 20 or more doctoral degrees in one or more disciplines. There were 109 other Ph.D. institutions in the NSOPF:93 sampling frame;

3. Comprehensive colleges and universities (public or private): These institutions offer a full range of baccalaureate programs and are committed to graduate education through the master's degree. They award 20 or more master's degrees annually in one or more disciplines. There were 578 comprehensive institutions in the NSOPF:93 sampling frame;

4. Liberal arts colleges (public or private): These institution are primarily undergraduate colleges with major emphasis on baccalaureate degree programs. There were 578 liberal arts institutions in the NSOPF:93 sampling frame;

5. Two-year colleges (public or private): These institutions offer associate of arts certificate or degree programs and, with few exceptions, offer no baccalaureate degrees. There were 1,107 2-year institutions in the NSOPF:93 sampling frame;

6. Independent medical institutions (public or private): Those not considered as part of a 4-year college or university. There were 52 independent medical institutions in the NSOPF:93 sampling frame;

7. Religious colleges (private only): There were 309 religious institutions in the NSOPF:93 sampling frame;

8. Other (public/private): Includes a wide range of professional and other specialized degree-granting colleges and universities. There were 222 other specialized institutions in the NSOPF:93 sampling frame; and

9. Unknown (public/private): There were 197 institutions on the NSOPF:93 sampling frame that did not have a Carnegie classification.

First Stage Sampling

Since there are no public religious institutions, the cross-classification of control by type had 17 cells. However, the desired sampling rates for three of the cells—public research, private research, and public "other Ph.D."—were so close to 100 percent that it was appropriate to sample all of the institutions in those cells. Therefore, a single sampling stratum was constructed for these institutions, and all institutions were selected in that stratum (i.e., selected with certainty). Grouping these institutions together was appropriate from a sampling design and selection standpoint, although this stratum does not comprise a group of analytic interest.

Institutions in the 14 other strata were referred to as "noncertainty" institutions.[3] The stratum sample sizes, determined by a preliminary pass through the 14 strata, were allocated proportional to the total estimated number of faculty and instructional staff in each stratum. In those strata, the first stage selections were made using stratified sampling with probabilities within each stratum proportional to the expected numbers of faculty and instructional staff. Systematic probability proportional to size (PPS) sampling was used with measure of size (MOS) equal to 41 or the estimated number of faculty (and instructional staff), whichever was larger. MOS was defined as the total number of faculty and instructional staff as specified in the most recent IPEDS Fall Staff Survey available (1989–90). Of the 3,256 institutions listed on the sample frame, 3,106 had a MOS available. For the remaining 150 (4.6 percent) institutions for which faculty data were missing, MOS was imputed.

In systematic sampling, the order in which the institutions are listed on the frame is important, as it reflects an implicit stratification. Within each stratum the institutions were sorted by MOS in a "serpentine" manner, i.e., if one stratum was in ascending order by MOS, the next was descending, the one after that was ascending, and so on. This procedure helped to balance the sample with respect to institution size (based on number of faculty). A total of 789 institutions were initially selected and later supplemented with 185 institutions for a total of 974 selected in the first-stage.

Institutions were selected in two replicates. The first replicate "Pool 1" contained the initial sample of noncertainty and certainty institutions. The second replicate "Pool 2" was sorted into random order within strata and contained only noncertainty institutions. Institutions that were determined ineligible or could not be recruited after extensive follow-up were replaced at random by institutions within the same explicit stratum in Pool 2. Replacement institutions for the certainty stratum were selected at random from similar strata. ("Other Ph.D.," "Public Comprehensive," and "Private Comprehensive" sampling strata were used for this purpose.)

Second Stage Sampling

At the second stage of sample selection, the NSOPF:93 sampling frame consisted of lists of faculty and instructional staff obtained from 817 participating institutions. Each institution was randomly assigned a target total sample size, say n, of either 41 or 42 faculty to yield the desired average sample size of 41.5. Whenever an institution had fewer than 42 individuals, all faculty and instructional staff were selected. Otherwise, the following oversampling sizes[4] were used to select groups to ensure their adequate representation in the sample and to meet NSF and NEH analytic objectives: full-time females (3.36), blacks or Hispanics (5.60), Asians or Pacific Islanders (1.12), faculty in four NEH disciplines (2.24)—philosophy/religion, foreign languages, English language and literature, and history—and all others (0.00). All listed individuals who would qualify for more than one group were assigned to the group for which the oversampling

[3] The "noncertainty" sampling strata were broken down as follows: private, other Ph.D.; public, comprehensive; private, comprehensive; public, liberal arts; private, liberal arts; public, medical; private, medical; private, religious (there are no public religious colleges); public, two-year; private, two-year; public, other; private, other; public, unknown; and private, unknown.

[4] The oversample size for a group is the difference between the expected sample size for the group and the expected sample size that would have been obtained if all faculty had been sampled at the same rate, i.e., in the absence of oversampling.

rate (here defined as the oversample size divided by the number of individuals qualifying for the group) was largest. These five groups were used as strata for sampling faculty. The residual sample size (*n* minus the sum of the oversample sizes) was allocated across the five strata in proportion to the number of faculty in the strata. Then, the total sample in each stratum (consisting of the oversample size plus the proportionally allocated residual) was specified by simple random sampling without replacement, with the sampling independent from one faculty stratum to the next. For more details about second stage sampling, refer to the *1993 National Study of Postsecondary Faculty: Methodology Report* (NCES 97–467).

Data Collection and Response Rates

Prior to data collection, it was first necessary to obtain cooperation from the sampled institutions. Each institution was asked to provide annotated lists of all faculty and instructional staff according to the eligibility (and oversampling) criteria needed for second stage sampling. Between October 1992 and early March 1993, 26 institutions in the original sample were replaced by randomly selected comparable institutions (from Pool 2): 5 because they were ineligible and 21 because they were determined to be final refusals. After trying to gain cooperation from the initial sample of 789 institutions for almost six months, it was determined that a certain number of other institutions were unlikely to participate in the study. These institutions were identified in March 1993 and 159 additional institutions were randomly selected within the relevant strata (from Pool 2).

Project staff tried to gain cooperation from original and replacement (or supplemental) institutions simultaneously.[5] Of the 974 institutions in the total sample, 12 (1.2 percent) were found to be ineligible.[6] Ineligible institutions included those which had closed or which had merged with other institutions, satellite campuses that were not independent units, and institutions that did not grant any degrees or certificates. A total of 817 eligible institutions agreed to participate (i.e., to provide a list of faculty and instructional staff), for a list participation rate of 84.9 percent (83.4 percent, weighted).

Faculty data collection was conducted between January and December 1993, with a two-month hiatus during July and August while most faculty and instructional staff were on summer break. The faculty survey relied on a multi-modal data collection design which combined an initial mailed questionnaire with mail and telephone prompting supplemented by computer-assisted telephone interviewing (CATI). Questionnaire and follow-up mailings were sent out in large waves between January and July 1993 as the lists were received, sampled, and processed. Coordinators at the participating institutions who signed the NCES affidavit of nondisclosure and confidentiality also assisted in the effort by prompting nonrespondents to return their completed

---

[5] Since the Pool 2 institutions were additional random selections into the sample, the effect of using Pool 2 institutions is no different than if a larger number of institutions had been selected initially and the pools had not been used at all. The response rates for Pool 1 institutions, and for Pool 1 and Pool 2 institutions combined, have the same expected value. Since it is based on a larger sample, the response rate for Pool 1 and Pool 2 combined is a more accurate estimator of the population response rate.

[6] When ineligible institutions were excluded from the sample, the sum of weights for eligible institutions was 3,188, rather than the 3,256 institutions specified in the sampling frame.

questionnaires to NORC. Of the 31,354 faculty and instructional staff sampled,[7] 1,590 (5.1 percent) were found to be ineligible, which included staff who were deceased or no longer at the institution, staff who did not have a Fall 1992 teaching assignment, and teaching assistants. A total of 25,780 questionnaires were completed for a response rate of 86.6 percent (84.4 percent, weighted). The overall faculty response rate (institution list participation rate multiplied by the faculty questionnaire response rate) was 73.5 percent (70.4 percent, weighted). The unweighted faculty response rate for public 4-year institutions was 87.8 percent and 84.2 percent for private 4-year institutions.

Institution data collection was conducted between September 1993 and May 1994. The institution survey combined a mailed questionnaire with mail and telephone prompting directed at both participating (817 institutions which submitted faculty lists) and nonparticipating institutions (145 institutions), for an eligible sample of 962 institutions. For 385 (44 percent) of the self-administered questionnaires completed, the institutional coordinator who had provided the original list was the main respondent, although other institution staff usually contributed to the effort. A total of 872 institution questionnaires were completed for a response rate of 90.6 percent (93.5 percent, weighted).

Best Estimates of Faculty

In comparing the weighted estimates based on the lists of faculty and instructional staff provided by institutions with those based on the institution questionnaires, several patterns emerged that were contrary to expected results. Although some variance in the estimates based on the lists and the institution questionnaires was expected, the magnitude of the difference was larger than anticipated. This, in and of itself, was not seen as a problem since the estimates were from two different sources. What was less plausible were the trends in the estimates of part-time faculty between NSOPF:88 and NSOPF:93. The institution survey showed a 5 percent increase in the estimate of part-time faculty between the Fall of 1987 and the Fall of 1992. The faculty survey, based on the lists of faculty and instructional staff provided by the institution, showed no change in the percentage of part-time faculty between the two points in time. The weighted estimates based on the lists also showed a 37.5 percent decrease in the number of health sciences faculty and instructional staff from the Fall of 1987 to the Fall of 1992. Institution recontact was necessary to resolve these discrepancies and to determine the "best estimates" of total, full- and part-time faculty and instructional staff.

The best estimates were derived following a reconciliation and verification recontact with a subset of institutions which had discrepancies of 10 percent or greater between the total number enumerated on the faculty list used for sampling and the total number reported on the institution questionnaire. The recontact effort also included 120 institutions identified by NCES as employing health sciences faculty.

---

[7] Initially, 33,354 faculty were sampled. To reduce costs, 2,000 nonresponding faculty and instructional staff were randomly eliminated from the sample through subsampling in August 1993. A higher proportion of part-time faculty and instructional staff were eliminated than remained; this was taken into account in the calculation of faculty weights.

Of the 760 "matched" institutions[8] (i.e., institutions which provided both a completed institution questionnaire and a list of faculty and instructional staff), 450 (59 percent) had a discrepancy of 10 percent or more between the questionnaire and the list, and 61 of the 450 had health sciences faculty.

Of the 817 institutions who provided lists of faculty and instructional staff, 509 institutions (450 with 10 percent or greater discrepancies plus an additional 59 institutions with health sciences faculty) were recontacted. Before recontacting each institution, each discrepancy was reviewed to eliminate obvious clerical or list posting errors. A best estimate was obtained for 492 (or 96.7 percent) of these institutions.

It is important to point out that 118 of the reconciled institutions were unable to provide a specific reason for the discrepancies. For the 374 that provided reasons, the most commonly cited reason was the omission of some part- or full-time faculty from the list provided for sampling faculty. This occurred for 107 institutions. Some institutions included certain types of medical faculty in one set of estimates, but not in the other. Downsizing affected faculty counts at several institutions. Another factor in the discrepancies was the time interval (in some instances a year or more) between the time the list of faculty and instructional staff was compiled and the time the institution questionnaire was completed. The list did not always include new hires for the fall term, which were counted in the institution questionnaire. Some institutions provided "full-time equivalents" (FTEs) on the institution questionnaire rather than the actual headcount of part-time staff that was requested. In some instances, however, where part-time faculty and instructional staff were over-reported (on either the list or the questionnaire) the reason involved confusion between the pool of part-time or temporary staff employed by, or available to, the institution and the number actually employed during the fall semester.

NORC used data gathered in the recontacting effort to adjust the original list of faculty and instructional staff to incorporate recontacted institutions' best estimates into the final estimates. The first step in this process used as its starting point the original list, which reported totals for full-, part-time, and total faculty and instructional staff for each of the 817 participating institutions. However, in some cases, institutions which supplied a total number did not supply a breakdown of the total number into full- and part-time components.[9] For these institutions, NORC used a two-step procedure of deriving best estimates: first, deriving "best total estimates" and, second, deriving "best full-time estimates." Best estimates for part-time staff were simply calculated by subtracting the number of full-time staff from the total number at each institution.

The next step in calculating best total estimates involved the substitution of the verified counts from the 492 institutions NORC recontacted. If an institution verified the counts from its original faculty list or was unable to confirm other estimates, the original list estimate was

---

[8] A total of 929 of the 962 eligible institutions (96.6 percent) participated in the survey in some way—either by completing an institution questionnaire or by submitting a faculty list. A total of 872 institutions completed institution questionnaires and 817 institutions provided faculty lists. Of the 817 institutions which submitted faculty lists, 760 of them also completed an institution questionnaire. Therefore, "matched" data—counts of the total number of faculty at the institution drawn from the faculty list and from the institution questionnaire—are available for only these 760 institutions.

[9] Eighty-four of the 817 institutions did not specify the employment status (i.e., full- or part-time) of faculty and instructional staff on their original lists.

retained as the best estimate. If the institution verified the institution questionnaire data as a more accurate estimate, questionnaire data were substituted for original list data as the best estimate. If the institution provided a different set of estimates, the new estimates were substituted for counts based on original list data.

Institutions which were nonrespondents in the verification effort and which had discrepancies of 10 percent or greater between the estimates of faculty and instructional staff based on the lists provided by institutions and those based on the institution questionnaire were adjusted by multiplying the ratio of verified counts to original counts for the 492 recontacted institutions by the original list count. Original list data were used for the institutions which were not selected for recontact. For all 817 institutions, the source of the final best estimates was as follows:

460 (56.3 percent) used original list data;
280 (34.3 percent) used questionnaire data;
61 (7.5 percent) used new estimates (other than questionnaire or original list data); and
16 (1.9 percent) were ratio-adjusted.

During the reconciliation effort, some ineligible faculty and instructional staff were excluded from the institution-level totals. This happened if recontacted institutions reported that the original faculty list had included ineligible faculty. This information was supplied by 23 institutions. It is assumed that faculty population estimates derived from the best estimate calculations include only eligible faculty. For more discussion of the verification process and calculation of best estimates, see the *1993 National Study of Postsecondary Faculty: Methodology Report* (NCES 97–467).

Weight Calculations

The weights for both the institution and faculty samples were designed to adjust for differential probabilities of selection and nonresponse. (For a detailed description of the weighting process, see the *1993 National Study of Postsecondary Faculty: Methodology Report* [NCES 97–467].) Weights for the institution sample were constructed in three steps. First, the institution's base weight—equal to the reciprocal of its probability of selection into the sample—was calculated. (This step reflected the several steps used to select the institutions from sample Pool 1 and sample Pool 2.) Second, the base weights were adjusted for institutions that had merged and so were effectively listed multiple times in the sampling frame.[10] Finally, a nonresponse adjustment factor was applied to the weights to compensate for institution-level nonresponse. A review of the data indicated that post-stratification adjustment was not needed.

Weights for the faculty sample were computed in four steps. First, the base conditional selection probabilities were calculated; these reflected the selection rates for faculty members given that their institutions were sampled. In this step, the initial selection probabilities also were adjusted to reflect the exclusion of a random subsample of faculty. Then the reciprocals of these selection probabilities were calculated to yield base conditional weights. Second, these weights were

[10] After the sample was selected and institutions were contacted, NORC discovered that a few of the institutions in the sample had merged with other institutions on the sampling frame. Since a merged institution would be in the sample if any listing of the institution was selected from the frame, its weight must be reduced accordingly.

multiplied by the first-stage nonresponse-adjusted weights to yield second-stage sampling weights adjusted for institutional nonresponse. Third, a second-stage nonresponse adjustment factor was applied to these latter weights to compensate for nonresponse by faculty members. Fourth, the nonresponse-adjusted weights were poststratified to the best estimates of total, full-, and part-time faculty and instructional staff by sampling stratum.

The poststratification adjustment should reduce sampling variability, and more importantly reduce any reporting biases and bias due to undercoverage of the faculty sampling frame. Poststratification provides a means of weighting the faculty respondents to represent all faculty on the original faculty sampling frame as well as faculty missed on the frame. The method is entirely analogous to the nonresponse adjustment, where faculty respondents are weighted up to represent themselves as well as the faculty nonrespondents. While the nonresponse adjustment is based upon the assumption that the means of respondents and nonrespondents are similar, the poststratification adjustment is based upon the assumption that the means of covered faculty and missed faculty are similar. Neither assumption is perfect, but the resulting estimates are thought to be more accurate than they would be in the absence of the adjustments.

Imputation of Missing Data

Item nonresponse occurred when a respondent did not answer one or more survey questions. The item nonresponse rates were generally low for the institution and faculty questionnaires, since missing critical (and selected other) items were retrieved by interviewers. The NSOPF:93 faculty questionnaire had a mean item nonresponse rate of .103 for 395 items in six sections. The NSOPF:93 institution questionnaire had a mean item nonresponse rate of .101 for 283 items in four sections.[11] Imputation for item nonresponse was performed for each survey item, to make the study results more inclusive.[12] "Don't know" responses were treated as item nonresponse and imputed for both the institution and faculty questionnaires. However, a second imputation was done for selected items in the faculty questionnaire with "don't know" responses, where this caused 30 percent or more of the responses to be eligible for imputation. In the second imputation, "don't knows" were treated as legitimate responses, and only in a case where there was no response to a survey item was imputation performed. For these items, in the second imputation, missing responses were imputed across all response categories, including the don't know category. This was done to allow researchers to choose how to treat don't knows in their analyses. Not applicable ("NA") responses were not imputed since these represented respondents who were not eligible to answer the relevant item.

Imputation was performed using several procedures. Missing gender, race, and employment status data on the faculty data file were imputed directly from information supplied by

---

[11] The item nonresponse rate is defined as the ratio of the total number of nonresponses to the total number of individuals eligible to respond to a questionnaire item. The mean item nonresponse rates reported here are the unweighted means of the item nonresponse rates for all items on the questionnaires. For a full description of item nonresponse, see the *1993 National Study of Postsecondary Faculty: Methodology Report* (NCES 97–467).

[12] For more information on imputation of missing data in sample surveys, see Graham Kalton and Daniel Kasprzyk, "Imputing for Missing Survey Responses." Paper presented at 1982 Proceedings of the Section on Survey Research Methods, American Statistical Association; Graham Kalton and Daniel Kasprzyk, "The Treatment of Missing Survey Data," *Survey Methodology* 12 (1) (June, 1986), pp. 1–16.

institutions on the lists used for sampling faculty and instructional staff, whenever this information was available.

Two statistical procedures, regression-based and hot-deck, were employed to impute other missing data on both data files. Regression-based imputation was used for continuous and dichotomous variables. Hot-deck imputation was used for all other variables. The type of imputation used was recorded by setting the appropriate value of the imputation flag for each survey item.

Sources of Error

The statistics in this report are estimates derived from a sample. Two broad categories of error occur in such estimates: sampling and non-sampling errors.

Sampling errors occur because the estimates are based on a sample of individuals in the population rather than on the entire population. Sampling errors can be quantified using statistical procedures in which a variance estimate is calculated. The variance estimate is the square of the standard error for the mean or proportion (including percent). The standard error measures the variability of the sample estimator in repeated sampling, using the same sample design and sample size. It indicates the variability of a sample estimator that would be obtained from all possible samples of a given design and size. Standard errors are used as a measure of the precision expected from a particular sample. If all possible samples were surveyed under similar conditions, intervals of 1.96 standard errors below to 1.96 standard errors above a mean or proportion would include the true population parameter in about 95 percent of the samples. In general, for large sample sizes (n greater than or equal to 30) and for estimates of the mean or the proportion, the intervals described above provide a 95 percent confidence interval. If sample sizes are too small, or if the parameters being estimated are not means or proportions, then these intervals may not correspond to the 95 percent confidence level.

Standard errors for all estimates presented in this report's tables were computed with a technique known as Taylor series approximation using the computer program SUDAAN.[13] Those opting to calculate variances with the Taylor-series approximation method should use a "with replacement" type variance formula. Specialized computer programs, such as SUDAAN and CENVAR,[14] calculate variances with the Taylor-series approximation method.

Sample estimates also are subject to bias from nonsampling errors. Nonsampling errors occur not only in sample surveys but also in complete censuses of entire populations. It is more difficult to measure the magnitude of these errors. They can arise for a variety of reasons: nonresponse, undercoverage, differences in respondent interpretation of the meaning of questions, memory effects, misrecording of responses, incorrect editing, coding, and data entry, time effects, or errors in data processing. For example, undercoverage (in which institutions did not provide a complete enumeration of eligible faculty) and listing of ineligible faculty necessitated the "best estimates" correction to the NSOPF:93 faculty population estimates. For a more detailed

---

[13] Babubhai V. Shah, Beth G. Barnwell, and Gayle S. Bieler, *SUDAAN User's Manual Release 6.4*. (Research Triangle Park, N.C.: Research Triangle Institute), 1995.
[14] U.S. Bureau of the Census, *CENVAR IMPS Version 3.1* (Washington DC: U.S. Bureau of the Census), 1995.

discussion of the undercoverage problem, refer to the *1993 National Study of Postsecondary Faculty: Methodology Report* (NCES 97–467). Whereas general sampling theory can be used, in part, to determine how to estimate the sampling variability of a statistic, nonsampling errors are not easy to measure. Measurement of nonsampling errors usually requires the incorporation of a methodological experiment into the survey or the use of external data to assess and verify survey results.

To minimize the potential for nonsampling errors, the faculty and institution questionnaires (as well as the sample design, data collection, and data processing procedures) were field-tested with a national probability sample of 136 postsecondary institutions and 636 faculty members in 1992. To evaluate reliability, a subsample of faculty respondents were re-interviewed. An extensive item nonresponse analysis of the questionnaires also was conducted followed by additional evaluation of the instruments and survey procedures.[15] An item nonresponse analysis also was conducted for the full-scale surveys. See the *1993 National Study of Postsecondary Faculty: Methodology Report* (NCES 97–467) for a detailed description of the item nonresponse analysis.

In addition, for the full-scale surveys, a computer-based editing system was used to check data for range errors, logical inconsistencies, and erroneous skip patterns. For erroneous skip patterns, values were logically assigned on the basis of the presence or absence of responses within the skip pattern whenever feasible, given the responses. Missing or inconsistent critical items were retrieved. Some small inconsistencies between different data elements remained in the data files. In these situations, it was impossible to resolve the ambiguity as reported by the respondent. All data were keyed with 100 percent verification of a randomly selected subsample of 10 percent of all questionnaires received.

Statistical Procedures

Two types of statistical procedures were employed in this report: *t*-tests for differences between means, and multiple regression. Each procedure is described below.

Differences Between Means

The descriptive comparisons were tested in this report using Student's *t* statistics. Differences between estimates are tested against the probability of a Type I error, or significance level. The significance levels were determined by calculating Student's *t* values for the differences between each pair of means or proportions and comparing these with published tables of significance levels for two-tailed hypothesis testing.

Student's *t* values may be computed, for comparisons using these tables' estimates, with the following formula:

---

[15] A complete description of the field test design and results can be found in Sameer Y. Abraham et al., *1992–93 National Study of Postsecondary Faculty: Field Test Report* (Washington, DC: U.S. Department of Education, National Center for Education Statistics [NCES:93–390]), February 1994.

$$t = \frac{(E_1 - E_2)}{\sqrt{(se_1^2 + se_2^2)}} \quad (1)$$

where E_1 and E_2 are the estimates to be compared and se_1 and se_2 are their corresponding standard errors. Note that this formula is valid only for independent estimates. When the estimates were not independent (for example, when comparing the percentages across a percentage distribution; in this report, across a row in a table), a covariance term was added to the denominator of the *t*-test formula.

There are hazards in reporting statistical tests for each comparison. First, comparisons based on large *t* statistics appear to merit special attention. This can be misleading since the magnitude of the *t* statistic is related not only to the observed differences in means or percentages but also to the number of respondents in the specific categories used for comparison. Hence, a small difference compared across a large number of respondents would produce a large *t* statistic.

A second hazard in reporting statistical tests for each comparison is making multiple comparisons among categories of an independent variable. For example, when making paired comparisons among different racial/ethnic groups, the probability of a Type I error for these comparisons taken as a group is larger than the probability for a single comparison. When more than one difference between groups of related characteristics or "families" is tested for statistical significance, one must apply a standard that assures a level of significance for all of those comparisons taken together.

Comparisons were made in this report only when $p \leq .05/k$ for a particular pair-wise comparison, where that comparison was one of *k* tests within a family. This guarantees both that the individual comparison would have $p \leq .05$ and that when *k* comparisons were made within a family of possible tests, the significance level of the comparisons would sum to $p \leq .05$.[16]

For example, in a comparison between males and females of average salary only one comparison is possible (males vs. females). In this family, $k = 1$, and the comparison can be evaluated with Student's *t*-test. When all possible comparisons are made among respondents in four racial/ethnic groups, then $k = 6$ and the significance level of each test must be $p \leq .05/6$, or .008. The formula for calculating family size (*k*) is as follows:

$$k = \frac{j \times (j - 1)}{2} \quad (2)$$

where *j* is the number of categories for the variable being tested. In the case of race/ethnicity, four racial/ethnic groups (Asian/Pacific Islander, black non-Hispanic, Hispanic, and white non-Hispanic) are being compared in this report, so substituting 4 for *j* in equation 2 yields:

---

[16] The standard that $p \leq .05/k$ for each comparison is more stringent than the criterion that the significance level of the comparisons should sum to $p \leq .05$. For tables showing the *t* statistic required to ensure that $p \leq .05/k$ for a particular family size and degrees of freedom, see Olive Jean Dunn, "Multiple Comparisons Among Means," *Journal of the American Statistical Association*. 56: 52-64.

$$k = \frac{4 \text{ x } (4\text{-}1)}{2} = 6 \qquad (3)$$

Multiple Regression

Tabular results are limited by sample size when attempting to control for additional factors that may account for the variation observed between two variables. For example, when examining salaries for faculty with different years of experience, it is impossible to know to what extent the observed variation is due to experience differences and to what extent it is due to differences in other factors related to experience, such as level of education, academic rank, and so on. However, if a table were produced showing salary by experience, by education, by rank, etc., the cell sizes would be too small to identify the patterns. When the sample size becomes too small to support controls for another level of variation, one must use other methods to take such variation into account.

To overcome this difficulty, multiple linear regression was used to obtain estimates of the differences across groups that were adjusted for covariation among a list of control variables.[17] The dependent variable, salary, was regressed on a set of descriptive variables such as race/ethnicity, age, etc. The dependent variable was the natural log of the base salary.[18] When the independent variable of interest is an indicator for a given subgroup (such as black non-Hispanic respondents) compared to a reference group (in this case, white non-Hispanic respondents), the *regression coefficient* indicates whether the dependent variable differs significantly for the subgroup compared to the reference group.

For example, consider a hypothetical case in which two variables, age (A) and gender (G), are used to describe an outcome, Y (such as salary). The variable gender is coded into a dummy variable for the female subgroup with males as the reference group:

Gender	*G*
Female	1
Male	0

The following regression equation is then estimated:

$$\ln Y = a + \beta_1 A + \beta_2 G \qquad (4)$$

where ln Y is the natural logarithm (base e) of salary, a is an intercept term, the β_n are the regression coefficients, A is the respondent's age, and G is the code for the dummy variable described above. Suppose the regression equation results in:

---

[17] For more information about regression, see M. S. Lewis-Beck, *Applied Regression*, vol. 22 (Beverly Hills, CA: Sage Publications, Inc., 1980) and W. D. Berry and S. Feldman, *Multiple Regression in Practice*, vol. 50 (Beverly Hills, CA: Sage Publications, Inc., 1987).

[18] See G.S. Maddala, *Introduction to Econometrics, 2nd ed.* (New York: Macmillan 1992) for alternatives to linear forms in regression.

$$\ln Y = 0.15 + (0.06)A + (-0.08)G \quad (5)$$

The estimated regression coefficient for age is positive, which suggests that for each additional year of age, a respondent's salary would increase, holding gender constant. The negative regression coefficient (-0.08) for gender suggests that, compared to the reference group (men), women's salaries are lower, holding age constant.

Regression coefficients for this report were produced using the computer package SUDAAN. Since NSOPF:93 is not a simple random sample, the standard errors for the estimated regression coefficients must take the complex sampling design into account. SUDAAN calculates appropriate standard errors for the coefficient estimates.

In this report, a series of nested models were estimated. For the first model shown in table 26, there were 12,081 cases used to calculate the regression; for each of the other three models, 12,075 cases were used because of missing values on one or more variables for six cases. It is unlikely that the inclusion of these six cases in the first regression had a large impact on the results.

Replicate Weights

Thirty-two replicate weights are provided on the data files for users who prefer another method of variance estimation. These weights implement the balanced half-sample (BHS) method of variance estimation,[19] and they have been created to handle the certainty stratum and to incorporate finite population correction factors for each of the 14 noncertainty strata. Two widely available software packages, WesVarPC®,[20] and PC CARP,[21] have capabilities to use replicate weights to estimate variances.

Analysts should be cautious about use of variances estimated by various methods that relate to one stratum or to a group of two or three strata. Such variance estimates may be based upon far fewer than 32 replicates, and thus the variance of the variance estimator may be large.

A Note About Estimates Based Upon Small Samples

Analysts who use either the restricted use faculty file or the institution file should also be cautious about cross-classifying data so deeply that the resulting estimates are based upon a very small number of observations. Analysts should interpret the accuracy of NSOPF:93 statistics in light of estimated standard errors and of the number of observations used in the statistics.

---

[19] For a discussion of the balanced half-sample (BHS) method of variance estimation, see Kirk M. Wolter, *Introduction to Variance Estimation* (New York: Springer-Verlag), 1985, pp. 110–152.
[20] Westat, Inc., *A User's Guide to WesVarPC®*, Version 2.0 (Rockville, MD.: Westat, Inc.), 1996.
[21] Wayne C. Fuller et al., *PC CARP IV*. (Ames, Iowa: Statistical Laboratory, Iowa State University), 1986.

A Special Note About Estimates of Health Sciences Faculty

Problems with estimates of health sciences faculty could only be partly rectified by the creation of new best estimates. The reconciliation effort helped to identify some institutions that failed to list health science faculty on their original faculty lists. However, because faculty list data recorded faculty members' disciplines only for faculty in the four NEH disciplines, it was impossible to poststratify to best estimates for health science faculty.

Health science faculty are more likely to perform individualized instruction or noncredit teaching activities than are other types of faculty participating in NSOPF:93. The largest concentration of faculty who conducted individualized instruction but who did not teach courses, was found in the health sciences. Of the estimated 76,200 faculty who conducted individualized instruction and taught no other course, 31,201, or 41 percent, of the total were health sciences faculty. The next largest group of faculty meeting these criteria were found in the natural sciences (8,805 or 11.6 percent). Because of the importance of individualized instruction to health sciences faculty, selecting for analysis only those faculty who had any for-credit instructional responsibilities may have the unintended consequence of excluding a greater number of health sciences faculty than is warranted. In the *1993 National Study of Postsecondary Faculty: Methodology Report* (NCES 97-467), the problem with health science estimates is discussed further and recommendations are made for future rounds of NSOPF.

Appendix B:

Standard Error Tables

Table B1.—Standard errors for table 1: Percentage distribution of faculty with U.S. citizenship whose primary responsibility is teaching according to gender, by race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Percentage in total	Percentage of racial/ethnic subgroup	
			Male	Female
Total	**12.6**	**0.00**	**0.57**	**0.57**
Race/ethnicity				
White, non-Hispanic	11.6	0.50	0.59	0.59
Black, non-Hispanic	2.2	0.36	1.73	1.73
Asian/Pacific Islander	1.3	0.21	2.65	2.65
Hispanic	1.5	0.24	2.39	2.39
American Indian/Alaskan Native	0.4	0.07	5.87	5.87

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B2.—Standard errors for table 2: Percentage distribution of faculty with U.S. citizenship whose primary responsibility is teaching according to employment status, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Full-time	Part-time
Total	**12.6**	**0.95**	**0.95**
Gender			
Male	8.6	1.13	1.13
Female	5.9	1.00	1.00
Race/ethnicity			
White, non-Hispanic	11.6	1.00	1.00
Black, non-Hispanic	2.2	2.12	2.12
Asian/Pacific Islander	1.3	3.48	3.48
Hispanic	1.5	3.16	3.16
American Indian/Alaskan Native	0.4	6.67	6.67

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B3.—Standard errors for table 3: Percentage distribution of full-time faculty whose primary responsibility is teaching according to base salary, and average base salary, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Less than $40,000	$40,000–49,999	$50,000–59,999	$60,000 or more	Average base salary
Total	**7.1**	**0.98**	**0.57**	**0.56**	**0.81**	**$388.62**
Gender						
Male	5.4	1.06	0.72	0.72	1.09	486.05
Female	2.9	1.21	0.83	0.58	0.49	354.22
Race/ethnicity						
White, non-Hispanic	6.6	1.03	0.61	0.60	0.85	416.28
Black, non-Hispanic	1.5	2.62	1.56	1.71	1.75	857.58
Asian/Pacific Islander	0.9	2.86	2.73	2.52	2.92	1,482.07
Hispanic	0.8	3.77	2.69	2.22	2.20	1,030.60
American Indian/ Alaskan Native	0.3	7.76	5.79	6.37	4.43	4,886.62

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B4.—Standard errors for table 4: Percentage distribution of full-time faculty whose primary responsibility is teaching according to tenure status, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Tenured	Tenure track	Not on tenure track	No tenure system
Total	**7.2**	**0.89**	**0.60**	**0.41**	**0.90**
Gender					
Male	5.5	0.97	0.67	0.46	0.83
Female	2.9	1.15	0.95	0.66	1.24
Race/ethnicity					
White, non-Hispanic	6.7	0.95	0.63	0.42	0.96
Black, non-Hispanic	1.6	2.49	1.88	1.77	1.52
Asian/Pacific Islander	0.9	2.99	2.03	1.30	2.39
Hispanic	0.8	3.26	3.35	1.53	1.79
American Indian/ Alaskan Native	0.3	7.80	5.46	4.53	7.55

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B5.—Standard errors for table 5: Percentage distribution of full-time faculty whose primary responsibility is teaching according to academic rank, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Full professor	Associate professor	Assistant professor	Instructor	Lecturer	Other/not applicable
Total	**7.2**	**0.80**	**0.61**	**0.62**	**0.68**	**0.22**	**0.45**
Gender							
Male	5.5	0.98	0.78	0.69	0.69	0.19	0.47
Female	2.9	0.83	0.79	0.97	0.93	0.48	0.57
Race/ethnicity							
White, non-Hispanic	6.7	0.84	0.65	0.67	0.68	0.23	0.49
Black, non-Hispanic	1.6	1.91	1.91	1.99	2.32	0.60	0.69
Asian/Pacific Islander	0.9	2.98	2.66	1.87	2.88	0.87	0.81
Hispanic	0.8	3.21	2.55	3.22	3.11	1.07	1.45
American Indian/ Alaskan Native	0.3	5.06	5.12	5.88	7.44	2.04	6.02

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B6.—Standard errors for table 6: Percentage distribution of full-time faculty whose primary responsibility is teaching according to highest degree attained, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Doc-torate	First-pro-fessional	Master's	Bachelor's	Other
Total	**7.2**	**0.84**	**0.54**	**0.76**	**0.30**	**0.24**
Gender						
Male	5.5	1.01	0.68	0.83	0.35	0.33
Female	2.9	0.98	0.50	1.00	0.41	0.19
Race/ethnicity						
White, non-Hispanic	6.7	0.87	0.56	0.77	0.29	0.26
Black, non-Hispanic	1.6	2.35	1.23	2.51	0.92	0.71
Asian/Pacific Islander	0.9	3.57	2.78	2.63	1.20	0.58
Hispanic	0.8	4.37	1.99	3.67	2.25	1.16
American Indian/ Alaskan Native	0.3	7.60	3.41	7.35	6.59	1.55

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B7.—Standard errors for table 7: Percentage distribution of full-time faculty whose primary responsibility is teaching according to age, and average age, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Under 35	35 to 44	45 to 54	55 and above	Average age
Total	**7.2**	**0.32**	**0.54**	**0.58**	**0.59**	**0.12**
Gender						
Male	5.5	0.41	0.68	0.74	0.80	0.16
Female	2.9	0.52	0.85	0.80	0.63	0.16
Race/ethnicity						
White, non-Hispanic	6.7	0.32	0.58	0.62	0.63	0.13
Black, non-Hispanic	1.6	1.84	1.89	2.09	1.76	0.48
Asian/Pacific Islander	0.9	1.24	2.60	3.23	3.13	0.55
Hispanic	0.8	1.77	3.23	3.18	3.18	0.72
American Indian/ Alaskan Native	0.3	1.24	6.81	6.27	8.16	1.36

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B8a.—Standard errors for table 8a: Percentage distribution of full-time faculty whose primary responsibility is teaching according to year received highest degree, and average number of years since receiving highest degree, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	1970 or earlier	1971–1980	1981 or later	Average years since receiving highest degree
Total	**7.2**	**0.63**	**0.55**	**0.62**	**0.13**
Gender					
Male	5.4	0.83	0.73	0.77	0.17
Female	2.9	0.65	0.83	0.93	0.16
Race/ethnicity					
White, non-Hispanic	6.6	0.68	0.58	0.67	0.14
Black, non-Hispanic	1.6	1.48	2.25	2.27	0.39
Asian/Pacific Islander	0.9	3.10	3.71	2.99	0.56
Hispanic	0.8	3.37	3.50	3.11	0.62
American Indian/ Alaskan Native	0.3	8.13	6.91	6.98	0.56

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B8b.—Standard errors for table 8b: Percentage distribution of full-time faculty whose primary responsibility is teaching according to gender and race/ethnicity, by year received highest degree: Fall 1992

	Estimated number in population (1,000s)	Total	1970 or earlier	1971–1980	1981 or later
Total	**7.2**	—	—	—	—
Gender					
Male	5.4	0.57	0.82	0.92	0.98
Female	2.9	0.57	0.82	0.92	0.98
Race/ethnicity					
White, non-Hispanic	6.6	0.56	0.69	0.89	0.72
Black, non-Hispanic	1.6	0.43	0.38	0.61	0.57
Asian/Pacific Islander	0.9	0.24	0.42	0.49	0.30
Hispanic	0.8	0.20	0.32	0.33	0.26
American Indian/ Alaskan Native	0.3	0.08	0.18	0.12	0.10

— Not applicable.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B9.—Standard errors for table 9: Percentage distribution of full-time faculty whose primary responsibility is teaching according to length of time in current job, and average length of time in current job, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	0–5 years	6–10 years	11–15 years	16 or more years	Average years in current job
Total	**7.2**	**0.63**	**0.46**	**0.46**	**0.68**	**0.14**
Gender						
Male	5.5	0.76	0.60	0.60	0.85	0.18
Female	2.9	0.95	0.67	0.57	0.82	0.16
Race/ethnicity						
White, non-Hispanic	6.7	0.65	0.50	0.48	0.71	0.15
Black, non-Hispanic	1.6	2.48	1.84	1.32	2.15	0.40
Asian/Pacific Islander	0.9	3.08	2.06	2.57	2.74	0.61
Hispanic	0.8	3.39	2.46	2.34	3.20	0.63
American Indian/ Alaskan Native	0.3	7.49	4.65	3.13	7.73	1.48

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B10.—Standard errors for table 10: Percentage distribution of full-time faculty whose primary responsibility is teaching according to years in current rank, and average years in current rank, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	0–5 years	6–10 years	11–15 years	16 or more years	Average years in current rank
Total	**7.1**	**0.71**	**0.51**	**0.45**	**0.53**	**0.11**
Gender						
Male	5.4	0.84	0.64	0.61	0.71	0.14
Female	2.9	0.95	0.68	0.49	0.51	0.11
Race/ethnicity						
White, non-Hispanic	6.6	0.74	0.54	0.46	0.58	0.11
Black, non-Hispanic	1.6	2.21	1.62	1.46	1.22	0.26
Asian/Pacific Islander	0.9	3.23	2.30	3.16	2.25	0.49
Hispanic	0.7	3.62	2.43	2.58	2.93	0.51
American Indian/ Alaskan Native	0.3	7.57	5.17	4.72	7.54	1.50

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B11.—Standard errors for table 11: Percentage distribution of tenured full-time faculty whose primary responsibility is teaching according to years with tenure, and average years with tenure, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	0–5 years	6–10 years	11–15 years	16 or more years	Average years with tenure
Total	**5.4**	**0.71**	**0.69**	**0.63**	**0.87**	**0.15**
Gender						
Male	4.4	0.80	0.81	0.76	1.03	0.18
Female	1.8	1.24	1.07	0.94	1.27	0.19
Race/ethnicity						
White, non-Hispanic	5.0	0.74	0.74	0.67	0.92	0.16
Black, non-Hispanic	0.9	3.16	2.73	2.29	2.97	0.44
Asian/Pacific Islander	0.7	3.27	2.95	3.28	4.12	0.65
Hispanic	0.5	3.49	4.06	3.55	4.21	0.74
American Indian/ Alaskan Native	0.2	9.29	4.58	7.16	8.65	1.51

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B12.—Standard errors for table 12: Percentage distribution of full-time faculty whose primary responsibility is teaching according to percentage of time spent on teaching activities, and average percentage, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Less than 50%	50 to 74%	75% or more	Average percentage of time
Total	**7.2**	**0.59**	**0.64**	**0.73**	**0.34**
Gender					
Male	5.5	0.79	0.85	0.87	0.42
Female	2.9	0.70	0.83	0.94	0.42
Race/ethnicity					
White, non-Hispanic	6.7	0.61	0.67	0.77	0.36
Black, non-Hispanic	1.6	1.94	2.35	2.12	1.07
Asian/Pacific Islander	0.9	2.71	3.02	3.53	1.57
Hispanic	0.8	2.97	2.91	3.37	1.67
American Indian/ Alaskan Native	0.3	4.09	7.41	7.54	2.69

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B13.—Standard errors for table 13: Percentage distribution of full-time faculty whose primary responsibility is teaching according to level of instruction, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Undergraduate only	Both graduate and undergraduate	Graduate only
Total	**7.0**	**0.83**	**0.54**	**0.65**
Gender				
Male	5.3	0.98	0.69	0.77
Female	2.9	0.90	0.63	0.67
Race/ethnicity				
White, non-Hispanic	6.5	0.86	0.58	0.68
Black, non-Hispanic	1.5	2.35	1.59	1.54
Asian/Pacific Islander	0.9	2.94	2.30	2.55
Hispanic	0.7	2.67	2.27	1.67
American Indian/Alaskan Native	0.3	5.33	5.28	0.84

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B14.—Standard errors for table 14: Among full-time faculty whose primary responsibility is teaching, average student contact hours per week and classroom hours per week, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Average student contact hours per week	Average classroom hours per week
Total	**7.0**	**8.56**	**0.08**
Gender			
Male	5.3	11.41	0.10
Female	2.9	9.55	0.10
Race/ethnicity			
White, non-Hispanic	6.5	8.17	0.09
Black, non-Hispanic	1.5	28.96	0.24
Asian/Pacific Islander	0.9	36.39	0.29
Hispanic	0.7	18.24	0.44
American Indian/Alaskan Native	0.3	23.37	1.50

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B15.—Standard errors for table 15: Percentage of full-time faculty whose primary responsibility is teaching who were pursuing research or other scholarly activity, and of those, percentage in funded research, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Percent in research or other scholarly activity	Of those, percent in funded research
Total	**7.2**	**0.80**	**0.90**
Gender			
Male	5.5	0.95	1.13
Female	2.9	0.91	1.07
Race/ethnicity			
White, non-Hispanic	6.7	0.81	0.93
Black, non-Hispanic	1.6	2.52	2.44
Asian/Pacific Islander	0.9	2.49	4.15
Hispanic	0.8	4.29	4.02
American Indian/Alaskan Native	0.3	7.69	6.99

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B16.—Standard errors for table 16: Percentage distribution of full-time faculty whose primary responsibility is teaching according to percentage of time spent on research, and average percentage, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	No time spent on research	1–10%	More than 10%	Average percentage of time on research
Total	**7.2**	**0.67**	**0.68**	**0.90**	**0.28**
Gender					
Male	5.5	0.81	0.81	1.10	0.35
Female	2.9	0.84	0.90	0.88	0.26
Race/ethnicity					
White, non-Hispanic	6.7	0.70	0.72	0.94	0.29
Black, non-Hispanic	1.6	2.28	1.94	2.01	0.66
Asian/Pacific Islander	0.9	2.37	2.98	3.09	1.14
Hispanic	0.8	2.85	2.92	4.02	1.23
American Indian/Alaskan Native	0.3	7.39	7.60	5.75	1.50

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B17.—Standard errors for table 17: Among full-time faculty whose primary responsibility is teaching and who were pursuing research or other scholarly activity, percentage distribution according to primary type of research activity, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Pure/ basic research	Applied research	Policy research	Literary work	Program design/ develop-ment	Other
Total	**5.6**	**0.79**	**0.73**	**0.43**	**0.54**	**0.55**	**0.43**
Gender							
Male	4.5	1.01	0.92	0.57	0.63	0.61	0.52
Female	2.0	0.99	1.13	0.56	0.86	0.89	0.67
Race/ethnicity							
White, non-Hispanic	5.1	0.85	0.76	0.46	0.57	0.60	0.46
Black, non-Hispanic	0.9	2.45	2.16	1.36	2.09	1.98	1.62
Asian/Pacific Islander	0.8	3.65	3.61	1.10	2.61	2.30	1.66
Hispanic	0.5	3.66	3.78	2.15	3.16	2.42	2.45
American Indian/ Alaskan Native	0.2	5.95	7.71	2.99	8.27	4.97	7.68

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B18a.—Standard errors for table 18a: Among full-time faculty whose primary responsibility is teaching, standardized numbers of various types of scholarly works in the previous two years, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Articles in refereed journals	Articles in non-refereed journals	Creative works in juried media	Creative works in non-juried media	Presentations	Exhibitions in fine arts	Patents or copyrights
Total	**7.2**	**0.04**	**0.05**	**0.09**	**0.07**	**0.03**	**0.12**	**0.09**
Gender								
Male	5.5	0.05	0.07	0.11	0.10	0.04	0.17	0.12
Female	2.9	0.04	0.05	0.13	0.09	0.04	0.14	0.12
Race/ethnicity								
White, non-Hispanic	6.6	0.04	0.05	0.09	0.08	0.03	0.13	0.10
Black, non-Hispanic	1.6	0.12	0.07	0.55	0.48	0.08	0.44	0.21
Asian/Pacific Islander	0.9	0.20	0.35	0.33	0.21	0.12	0.13	0.20
Hispanic	0.8	0.12	0.36	0.56	0.70	0.11	0.17	0.32
American Indian/ Alaskan Native	0.3	0.20	0.46	3.06	0.72	0.21	2.71	0.70

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

97

Table B18b.—Standard errors for table 18b: Among full-time faculty whose primary responsibility is teaching, standardized numbers of various scholarly writings in the previous two years, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Books	Monographs	Technical reports	Book reviews	Book chapters	Textbooks	Computer software
Total	**7.2**	**0.07**	**0.08**	**0.06**	**0.06**	**0.05**	**0.06**	**0.10**
Gender								
Male	5.5	0.09	0.11	0.07	0.07	0.06	0.08	0.13
Female	2.9	0.10	0.09	0.11	0.09	0.08	0.09	0.13
Race/ethnicity								
White, non-Hispanic	6.6	0.07	0.08	0.06	0.06	0.05	0.06	0.10
Black, non-Hispanic	1.6	0.16	0.59	0.15	0.23	0.17	0.14	0.18
Asian/Pacific Islander	0.9	0.22	0.52	0.61	0.21	0.37	0.43	0.22
Hispanic	0.8	0.59	0.62	0.40	0.45	0.35	0.23	1.97
American Indian/ Alaskan Native	0.3	0.24	0.28	0.23	0.31	0.43	1.16	0.27

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B19.—Standard errors for table 19: Percentage distribution of full-time faculty whose primary responsibility is teaching according to percentage of time spent on administration, and average percentage, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	No time spent on adminis-tration	1–10%	More than 10%	Average percentage of time on administration
Total	**7.2**	**0.64**	**0.57**	**0.52**	**0.16**
Gender					
Male	5.5	0.81	0.75	0.70	0.21
Female	2.9	0.94	0.81	0.72	0.22
Race/ethnicity					
White, non-Hispanic	6.7	0.67	0.61	0.56	0.17
Black, non-Hispanic	1.6	2.07	1.80	1.85	0.68
Asian/Pacific Islander	0.9	2.91	2.89	2.26	0.81
Hispanic	0.8	3.70	3.06	2.41	0.70
American Indian/Alaskan Native	0.3	7.44	6.64	7.39	1.97

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

BEST COPY AVAILABLE

Table B20.—Standard errors for table 20: Percentage of full-time faculty whose primary responsibility is teaching who chaired their departments, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Percent chairing department
Total	**7.2**	**0.46**
Gender		
Male	5.5	0.60
Female	2.9	0.61
Race/ethnicity		
White, non-Hispanic	6.7	0.49
Black, non-Hispanic	1.6	1.59
Asian/Pacific Islander	0.9	2.00
Hispanic	0.8	2.32
American Indian/Alaskan Native	0.3	6.62

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

BEST COPY AVAILABLE

Table B21.—Standard errors for table 21: Percentage distribution of full-time faculty whose primary responsibility is teaching according to percentage of time spent on service, and average percentage, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	No time spent on service	1–10%	More than 10%	Average percentage of time on service
Total	**7.2**	**0.63**	**0.62**	**0.43**	**0.13**
Gender					
Male	5.5	0.80	0.72	0.59	0.18
Female	2.9	0.84	0.89	0.56	0.17
Race/ethnicity					
White, non-Hispanic	6.7	0.67	0.64	0.46	0.14
Black, non-Hispanic	1.6	2.16	2.10	1.87	0.96
Asian/Pacific Islander	0.9	3.32	3.12	1.66	0.42
Hispanic	0.8	3.26	3.72	2.25	0.60
American Indian/Alaskan Native	0.3	7.39	7.52	2.71	1.13

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

BEST COPY AVAILABLE

Table B22.—Standard errors for table 22: Percentage distribution of full-time faculty whose primary responsibility is teaching according to institution type, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Research university	Doctoral university	Compre-hensive college	Liberal arts college	2-year college	Other
Total	**7.2**	**1.35**	**1.09**	**0.85**	**0.42**	**0.90**	**0.51**
Gender							
Male	5.5	1.55	1.20	1.00	0.48	0.95	0.64
Female	2.9	1.20	1.00	0.96	0.77	1.17	0.54
Race/ethnicity							
White, non-Hispanic	6.7	1.37	1.11	0.91	0.50	0.90	0.53
Black, non-Hispanic	1.6	2.95	1.45	4.26	2.87	3.52	1.55
Asian/Pacific Islander	0.9	4.18	2.02	3.06	1.13	3.25	2.75
Hispanic	0.8	2.86	1.86	4.28	1.17	4.74	1.19
American Indian/ Alaskan Native	0.3	3.90	4.51	4.50	4.46	7.39	0.00

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

BEST COPY AVAILABLE

Table B23.—Standard errors for table 23: Percentage distribution of full-time faculty whose primary responsibility is teaching according to gender, by teaching field: Fall 1992

	Estimated number in population (1,000s)	Male	Female
Total	**7.2**	**0.58**	**0.58**
Teaching field			
Business	1.4	1.78	1.78
Education	1.4	2.02	2.02
Engineering	1.2	1.21	1.21
Fine Arts	1.8	1.84	1.84
Nursing	1.2	0.67	0.67
Other health	1.7	2.75	2.75
English and foreign languages	1.3	1.49	1.49
History and philosophy	0.8	1.83	1.83
Law	1.7	3.44	3.44
Biological sciences	1.1	2.28	2.28
Physical sciences	1.1	1.52	1.52
Math and computer science	1.3	1.52	1.52
Social science	1.7	1.32	1.32
Occupational programs	1.0	2.26	2.26
Other	1.5	1.79	1.79

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

BEST COPY AVAILABLE

Table B24.—Standard errors for table 24: Among full-time faculty whose primary responsibility is teaching, percentage distribution according to teaching field, by gender and race/ethnicity: Fall 1992

	Estimated number in population (1,000s)	Business	Education	Engineering	Fine arts	Nursing	Other health	English and foreign languages
Total	**7.2**	**0.36**	**0.35**	**0.33**	**0.48**	**0.31**	**0.44**	**0.32**
Gender								
Male	5.5	0.48	0.40	0.47	0.55	0.05	0.57	0.35
Female	2.9	0.46	0.57	0.16	0.57	0.81	0.53	0.62
Race/ethnicity								
White, non-Hispanic	6.6	0.39	0.37	0.34	0.51	0.31	0.45	0.35
Black, non-Hispanic	1.6	0.98	1.23	0.94	1.12	1.74	1.89	0.98
Asian/Pacific Islander	0.9	1.03	0.82	2.58	2.03	1.34	2.82	1.73
Hispanic	0.8	1.75	2.00	1.39	1.83	0.62	1.07	2.43
American Indian/ Alaskan Native	0.3	6.46	5.41	5.83	3.85	1.45	2.23	4.62

Table B24.—Standard errors for table 24: Among full-time faculty whose primary responsibility is teaching, percentage distribution according to teaching field, by gender and race/ethnicity: Fall 1992—Continued

	History and philosophy	Law	Biological sciences	Physical sciences	Math and computer science	Social science	Occupational programs	Other
Total	**0.22**	**0.48**	**0.27**	**0.28**	**0.33**	**0.41**	**0.27**	**0.38**
Gender								
Male	0.31	0.52	0.38	0.41	0.45	0.53	0.39	0.50
Female	0.29	0.45	0.35	0.23	0.36	0.50	0.24	0.49
Race/ethnicity								
White, non-Hispanic	0.23	0.49	0.27	0.29	0.34	0.44	0.29	0.40
Black, non-Hispanic	0.71	0.73	1.24	0.88	1.04	1.38	0.77	1.17
Asian/Pacific Islander	0.75	0.94	1.65	1.83	2.19	1.40	1.00	1.32
Hispanic	0.99	1.15	1.37	1.65	1.50	2.69	1.28	1.93
American Indian/ Alaskan Native	1.63	0	2.07	0.30	5.20	4.33	2.40	0.40

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B25.—Standard errors for table 25: Among full-time faculty whose primary responsibility is teaching, percentage distribution according to geographical region, by race/ethnicity: Fall 1992

	Total	White, non-Hispanic	Black, non-Hispanic	Asian/ Pacific Islander	Hispanic	American Indian/ Alaskan Native
Estimated number in population (1,000s)	7.2	6.7	1.6	0.9	0.8	0.3
Percentage in region						
Northeast	1.57	1.61	3.23	3.32	2.58	4.24
New England	0.88	0.93	0.63	1.48	1.15	2.10
Mid-Atlantic	1.36	1.38	3.18	3.06	2.27	3.73
U.S. Service Schools	0.24	0.26	†	0.27	†	†
Midwest	1.89	1.95	2.86	3.40	2.00	7.64
Great Lakes	1.63	1.66	2.78	3.15	1.22	7.24
Plains	1.27	1.35	0.51	1.52	1.55	4.57
South	1.97	1.97	4.38	3.48	5.22	7.64
Southeast	1.80	1.79	4.68	4.68	4.83	4.93
Southwest	1.21	1.19	2.89	2.23	4.73	7.16
West	1.59	1.59	1.68	4.66	4.30	5.33
Rocky Mountains	0.77	0.84	0.24	0.27	1.71	0.20
Far West	1.45	1.41	1.65	4.67	4.07	5.32

† Insufficient data to provide an estimate (no cases in the sample in this cell).

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Table B26.—Standard errors for table 26: Among full-time faculty whose primary responsibility is teaching, regression coefficients for multivariate models of factors associated with base salary: Fall 1992

	Model 1	Model 2	Model 3	Model 4
Intercept	0.011	1.205	1.199	1.476
Female (compared to male)	0.012	0.013	0.013	0.013
Race/ethnicity (compared to white, non-Hispanic)				
Black, non-Hispanic	0.039	0.040	0.038	0.038
Asian/Pacific Islander	0.030	0.028	0.027	0.028
Hispanic	0.025	0.019	0.018	0.017
American Indian/Alaskan Native	0.065	0.069	0.068	0.071
Years since highest degree attained (in 10s)		0.006	0.006	0.008
Doctorate or first-professional degree (compared to other)		0.016	0.016	0.016
Level of instruction (compared to both undergraduate and graduate)				
Undergraduate only		0.016	0.016	0.016
Graduate only		0.021	0.021	0.021
Percent time teaching/ percent time research *		0.017	0.018	0.017
Scholarly works *		0.025	0.025	0.023
Region (compared to South)				
Northeast			0.019	0.019
Midwest			0.018	0.018
West			0.020	0.019
Institution type (compared to other)				
Research			0.037	0.035
Doctoral			0.042	0.040
Comprehensive			0.036	0.034
Liberal arts			0.042	0.039
Two-year			0.037	0.036

Table B26.—Standard errors for table 26: Among full-time faculty whose primary responsibility is teaching, regression coefficients for multivariate models of factors associated with base salary: Fall 1992—Continued

	Model 1	Model 2	Model 3	Model 4
Life systems field (compared to non-life systems field)			0.012	0.011
"Hard" field (compared to "soft" field)			0.012	0.012
Pure field (compared to applied field)			0.013	0.013
Tenured (compared to non-tenured)				0.017
Academic rank (compared to other)				
Full professor				0.022
Associate professor				0.022
Assistant professor				0.022
Adjusted R^2	—	—	—	—

— Not applicable.

* Variables were divided by 100.

NOTE: Dependent variable is logged.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

Appendix C:

Additional Data

☆ U. S. GOVERNMENT PRINTING OFFICE: 2000-464-497/20071

Table C1.—Among full-time faculty whose primary responsibility was teaching, average numbers of various types of scholarly works, by academic field: Fall 1992

	Recent articles in refereed journals	Recent chapters in edited volumes	Recent computer software products	Recent creative works in juried media	Recent creative works in nonjuried media	Recent exhibitions in fine arts	Recent mono-graphs published	Recent other books published	Recent patents or copyrights	Recent presen-tations	Recent research or technical reports	Recent reviews of books	Recent textbooks published
Total	**1.08**	**0.27**	**0.07**	**0.13**	**0.37**	**1.24**	**0.06**	**0.09**	**0.06**	**2.68**	**0.71**	**0.39**	**0.07**
Principal teaching or research field													
Agriculture/home ec.	2.14	0.23	0.08	0.21	0.67	0.13	0.14	0.06	0.04	4.27	1.79	0.19	0.10
Business	0.98	0.18	0.16	0.05	0.27	0.05	0.06	0.10	0.03	2.14	1.00	0.26	0.08
Communications	0.90	0.32	0.06	0.09	2.37	1.09	0.09	0.08	0.13	3.21	0.35	0.33	0.08
Teacher education	0.75	0.17	0.06	0.04	0.66	0.52	0.10	0.06	0.03	4.48	0.69	0.38	0.07
Other education	1.12	0.28	0.03	0.15	0.43	0.35	0.12	0.06	0.05	4.85	1.05	0.28	0.07
Engineering	2.36	0.25	0.23	0.07	0.31	0.02	0.03	0.04	0.11	4.24	2.43	0.19	0.08
Fine arts	0.32	0.10	0.02	0.41	0.56	14.17	0.02	0.10	0.18	2.36	0.25	0.47	0.05
First-prof. health sciences	2.68	0.74	0.04	0.13	0.28	0.13	0.08	0.01	0.02	3.52	0.32	0.19	0.10
Nursing	0.38	0.17	0.01	0.02	0.26	0.03	0.03	0.03	0.01	1.88	0.41	0.18	0.02
Other health sciences	1.22	0.36	0.03	0.01	0.16	0.36	0.06	0.09	0.03	2.99	0.88	0.25	0.07
English and literature	0.55	0.25	0.03	0.58	0.56	0.58	0.03	0.14	0.09	2.25	0.36	0.55	0.06
Foreign languages	1.11	0.39	0.03	0.21	0.19	0.29	0.05	0.16	0.04	2.26	0.17	0.65	0.08
History	1.02	0.42	0.02	0.07	0.28	0.16	0.14	0.19	0.13	2.05	0.48	1.28	0.06
Philosophy and religion	1.10	0.58	0.01	0.18	0.40	0.15	0.03	0.17	0.03	2.46	0.30	0.63	0.08
Law	0.75	0.33	0.01	0.00	0.27	0.06	0.02	0.25	0.02	4.18	1.43	0.33	0.12
Biological sciences	1.83	0.25	0.03	0.02	0.28	0.03	0.05	0.07	0.03	2.32	0.70	0.15	0.06
Physical sciences	2.05	0.19	0.13	0.03	0.17	0.08	0.03	0.04	0.04	2.09	0.77	0.17	0.03
Mathematics and statistics	0.84	0.11	0.07	0.01	0.06	0.04	0.01	0.06	0.03	1.40	0.27	0.38	0.07
Computer sciences	0.49	0.06	0.34	0.08	0.20	0.08	0.01	0.05	0.02	1.30	0.62	0.22	0.10
Economics	1.47	0.50	0.07	0.04	0.12	0.02	0.12	0.16	0.08	2.64	1.50	0.56	0.12
Political sciences	0.83	0.56	0.01	0.02	0.21	0.36	0.09	0.21	0.03	3.69	0.26	0.92	0.13
Psychology	1.58	0.37	0.09	0.02	0.31	0.04	0.03	0.06	0.07	3.30	0.44	0.29	0.05
Sociology	1.03	0.39	0.01	0.02	0.51	0.04	0.11	0.15	0.04	3.05	0.73	0.57	0.10
Other social sciences	0.96	0.42	0.04	0.05	0.42	0.10	0.12	0.13	0.03	3.00	0.77	0.79	0.06
Occupation programs	0.37	0.05	0.07	0.05	0.22	0.06	0.02	0.02	0.02	1.29	0.60	0.10	0.05
All other programs	0.93	0.35	0.06	0.12	0.32	0.33	0.09	0.11	0.07	3.02	0.84	0.51	0.08

NOTE: Includes U.S. citizens only.

SOURCE: U.S. Department of Education, National Center for Education Statistics, National Study of Postsecondary Faculty 1992–93 (NSOPF:93).

ISBN 0-16-050303-5

United States
Department of Education
Washington, DC 20208-5641
Official Business
Penalty for Private Use, $300

Postage and Fees Paid
U.S. Department of Education
Permit No. G-17

Standard Mail (A)

BEST COPY AVAILABLE